

# MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XX

Harold N. Moldenke

## VERBENA OFFICINALIS L.

Additional citations: GERMANY: Herb. Martius s.n. (Br); Herb. Monac. s.n. [München, VII.1901] (Ca--404334); Herb. Mus. Bot. Stockholm s.n. [29/7/1889] (S), s.n. [Berlin] (S), s.n. [Breslau] (S), s.n. [Germania] (S); Herrenkohl s.n. (La); Hisinger s.n. [Charlottenburg] (S); Holzinger s.n. [Kunzelau, 1884] (W--245962), s.n. [Wurtemberg] (N); G. Jensen s.n. [30/8/1870] (S); Kausch s.n. [Rottstock, 1869] (La); Kellerman s.n. [Göttingen, 4 Aug. 1879] (Ka); E. H. L. Krause 16821 (B); Kretzer s.n. [Braunschweig, 23/7/83] (Io--92222), s.n. [23/7/83] (Go, Pl--76949); Kretzhmer s.n. [7.VIII.25] (S); Lademann s.n. [Brandenburg, 25.8.1933] (N); Ljungström s.n. [21/7/1879] (Go, S); Lundberg s.n. [8/7/1954] (Go); Martius s.n. (Br); Meister s.n. [Aug. '08] (Go, S), s.n. [Pommelsbrunn] (Gg); Mettzbach s.n. [August 1870] (Gg--31392); Mohlins s.n. [Lindau, 13/7/1937] (S); Moll s.n. [Marlofstein, 1781] (Br); Ohl s.n. [Kiel, IX.07] (Go); Olin s.n. [Juli 1892] (Gg, Go, S); Ploser s.n. [Falkenburg, 6.72] (S); A. Prager s.n. (Cm); Prechtelsbauer s.n. [Aug. 1901] (S); Puchtler 1244 (Ca--180756, Ca--988783, Gg, Go); Reineck s.n. [Arnstadt, VII.1914] (Oa); Schemmann s.n. [22/8/1907] (Go); Schepzig s.n. [1889] (Go); Schiede s.n. [München, Aug. 20] (Br); R. Schulz s.n. [August 1913] (B); Schulz s.n. [Immenhausen, 7 August 1907] (B); Schulz & Schulz s.n. [Chorin, 1892] (B), s.n. [Chorin, 25.7.1896] (B); Schwöder s.n. [Mähren, Juli 1882] (Io--92221); Simmons s.n. [29 Juli 1893] (Go, S); Starcs 7565 (S); Vestergren s.n. [29/7/1907] (S); H. Wagner 172 (Ca--444775); Wahlberg s.n. [Schöneberg] (S); Wibbe s.n. [Stromberg, 1862] (I), s.n. [Stromberg, Juli 1863] (I); T. Wolf s.n. [28 Aug. 1893] (La); Zetterstedt s.n. [Hamburg, 1852] (S). RÜGEN ISLAND: Herb. Mus. Bot. Stockholm s.n. [Insula Rugia, 1819] (S). AUSTRIA: Battes s.n. [Tyrol, 1876] (Mi); Blanchy s.n. [1876] (Ca--25184); Gander s.n. [25/8/1870] (W--147579); Gibbe s.n. [Tirol, 26.6.1940] (B); Hayek 701 (Go), 4280 (Go), s.n. [20 Juli 1902] (Go), s.n. [22 Juni 1903] (Go), s.n. [17.VII. 1921] (S); Heimerl s.n. [Aug. 21, 1923] (Se--1462); Herb. Mus. Bot. Stockholm s.n. [15 Aug. 1853] (S); M. Johnson s.n. [20/8/1931] (S); K. Keck s.n. (Pa, Po--70671); Leffler s.n. [Sept. 1867] (Go); D. K. Rechinger s.n. [21 Septemb. 1922] (Go); Söderlund s.n. [16.8.1922] (S); M. F. Spencer s.n. [Aachensee, 9/1887] (Ob--6729); Stearn s.n. [Moldenke & Moldenke 9159] (N). CZECHOSLOVAKIA:

Bohemia: Anderberg s.n. [28/6/1936] (S); Herb. Linnaeus s.n. (S); Lindell s.n. [Prag, 1906] (Ew); Sommer s.n. [15.VII.1910] (Vi). Moravia: Suza 260 (Br, Du--181627, Gg--267617, Go, I, S, S, W--1373931), s.n. [VII. 1925] (Um--13). State undetermined: Enander s.n. [20/8/1925] (S); Frisendahl s.n. [28/6/36] (Go); H. Lam s.n. (N); Petrak 665 (S, S); Schwüder s.n. [Juli 1882] (Go), s.n. [August 1887] (S); Sommer s.n. [22.VII.1913] (S); Sterner s.n. [9/7/1923] (S); Vestergren s.n. [25.VII.1922] (S). HUNGARY: Heinitz s.n. (S); Herb. F. Philippi s.n. [Hungaria] (Sg--25564); János s.n. [VIII.1906] (Go); Porutin s.n. [7/IX/1874] (Pu); Steinitz 1278 (Cm); Sztehlo 16892 (Bz--23785), s.n. [3/9/1874] (N). SWITZERLAND: Ayasse 4995 (Du, Um--16); Beger s.n. [Zurich, 28.6.12] (B); Bernet s.n. [Geneve] (N); R. Campbell s.n. (Mn--20480); Dahlsted s.n. [12/8/1893] (S); Ekman s.n. [26.7.1912] (S); Frymann s.n. [VII.99] (Go, S); Herb. Mus. Bot. Stockholm s.n. [8/8/72] (S); Hulphers s.n. [3.VIII.07] (S); Lindman s.n. [17/10/1884] (S); Macfarlane, Bechtel, & Harvey s.n. [Chur, July 23rd 1906] (Hp); Meissner 572 (Go); Raas s.n. [Tessin, Sept. 1929] (S); Schneck s.n. [July 28, 1903] (Ur); Segerström s.n. [30/10/1924] (S); Söderlund s.n. [Juli 1906] (S); Tiselino s.n. [4.8.1883] (S), s.n. [7.8.1883] (Hi--194850); Wijk s.n. [8/1892] (Go); Wulff s.n. [Lugano, Juni 1895] (Go, S). GREECE: Haussknecht s.n. [Kardiza, 1885] (B), s.n. [Thessalia superior] (Lu), s.n. (Br, F--photo, N--photo, Si--photo, Z--photo). IONIAN ISLANDS: Cephalonia: Borrmüller 1328 (B). Corfu: D. Hummel s.n. [22/9/1957] (S). ITALY: Ahlfgvengren s.n. [26/7/1921] (S); Alstroemer s.n. [Calabria] (S); J. Ball s.n. [Lido, Oct. 1847] (W--682456); Cacciato s.n. [10/7/1956] (S); Collector undesignated 765 (S), 1217 bis (Br); Commons s.n. [Florence] (Cm); De Toni s.n. [Modena, Auglio 1903] (N); Engelhardt s.n. [2/6/1934] (B); Errera & Errera s.n. [12 Sept. 1875] (Br); Gavioli s.n. [VII.1938] (N); Gresino s.n. [29.VII.1938] (N); Hayek s.n. [Isturien, 19 Juli 1900] (Go); Herb. Mus. Bot. Stockholm s.n. [Bagno-11] (S), s.n. [Syracuse] (S); Herb. Mus. Florentini s.n. [Sept. 1812] (Pa); Herb. W. H. Harvey s.n. [Bellovaco, Julio 1817] (Du--166449); Landerer & Sartori s.n. [Nauplia, 1834] (Br); Lenander s.n. [July 21, 1931] (S); Savi s.n. [9bre 1845] (S); Söderlund s.n. (S); Vignolo-Lutati s.n. [VII.1938] (N, N); E. Wall 5, in part [18/621] (Ew); L. F. Ward s.n. [Leaning Tower, Pisa, Aug. 1894] (W--229752); Zoolola s.n. [Ceppo, Augusto 1952] (Hi--177242). SICILY: Babington s.n. [Messina, 1845--1851] (C); Eric Hultén s.n. [4.4.1960] (S); Todaro 697 (Du, S), s.n. [Palermo, 1850] (S), s.n. [1000 m. alt.] (S). CRETE: R. Lauche 2337 (B). JUGOSLAVIA: Bosnia: Lenander s.n. [Juni 30, 1938] (S). Dalmatia: Lenander s.n. [June 19, 1938] (S); Novak s.n. [Lesina] (Lu). Istria: Frumda s.n.

[10.IX.1913] (S). Macedonia: Bornmüller 1601 (B); Seheen s.n. [Alsar, 25.6.18] (B). Montenegro: Lenander s.n. [Juni 10, 1938] (S); Pejovic s.n. [IX.935] (S). Serbia: Nicic s.n. [27.VII.1896] (Go). Slovenia: Lenander s.n. [Bled, Juni 3, 1934] (S). Trieste: Collector undesignated s.n. [Sta. Anne] (Lu); Lenander s.n. [Maj 24, 1934] (S); Verouvé s.n. [26.5.1886] (B). Province undetermined: E. Wall 5, in part [25/123] (Ew). ALBANIA: Alston & Sandwith 2786 (S); Baldacci 152 (Br). ROMANIA: Lohler s.n. [Transsilv.] (S). BULGARIA: Bornmüller s.n. [VIII.1886] (B). UNION OF SOCIALIST SOVIET REPUBLICS: Adzharia: Massaloky s.n. [Batumi, 3/VI] (Br). Azerbaijan: Heideman & Heideman s.n. [13.VIII.1934] (S). Turkmen-skaya: Sintenis 932 (B). Uzbek: Herb. Hort. Bot. Univ. Asiae Med. s.n. [Taschkent] (Se—44023); Vvedensky s.n. [Taschkent, 1919] (S). Republic undetermined: Kikodse s.n. [Kutars, Ozurgety] (S); Pavlov 517 [Karatau Mts. & Talas Alatau] (B), 1218 [Karatau Mts. & Talas Alatau] (B). MOROCCO: Boitel s.n. [17 juillet 1918] (Ca—882671); Cosson s.n. [Mardochee, 1875] (Pa); Faure s.n. [30.5.1931] (B); Quer 504 (Ca—370001). ALGERIA: Bové s.n. [Août 1837] (B). TUNISIA: Murbeck s.n. [16/6/1896] (S). TRIPOLITANIA: Dickson s.n. [circa Tripolium, 1827] (Du—166447). EGYPT: Hedenborg s.n. [Bujukdene] (S, S), s.n. (S, S); Sabet s.n. [22/4/1927] (Ka—77987); Shabetad 460.1136 (Ka—72820); Täckholm s.n. [24/10/1926] (S). MAURITANIA: Bové s.n. [Août 1837] (Br, Br). ERITREA: Pappi 4331 (Ca—902362, N, S), 4414 (S). ABYSSINIA: Curli 184 (Bm); Hildebrandt 445 (B); Schimper 7 (W—945770). BRITISH SOMALILAND: Collennette 409 (B); Glover & Gilliland 920 (Bm). CAPE VERDE ISLANDS: Santiago: Brunner s.n. (C). CONGO LEOPOLDVILLE: Bequaert 5537 (Br), 5976 (Br); De Witte 156 (Br, Br); Hendrickx 201 (Br, Br); Humbert 7566 bis (Br); Quarré 4622 (Br). UGANDA: Edel 2 (N), 324 (N). TANGANYIKA: J. W. Gregory s.n. [E. of falls, Han-nington River, 18 Apl.] (Bm), s.n. [West of Inkuyuni] (Bm); A. Peter 422b [O.I.17] (B), 1780 [O. I.43] (N), 1852 [O.I.44b] (B), 42460 [V.287] (B), 43726 [V.318] (B). KENYA: P. Chandler 2214 (B); Mearns 82 (N, W—630082), 1165 (W—631208), 1974 (W—631933), 1998 (W—631958). SOUTHERN RHODESIA: R. B. Drummond 4858 (S); C. E. Godman 221 (Bm); Rattray 397 (Rh); Wild 82 (N). REPUBLIC OF SOUTH AFRICA: Cape Province: Brueckner 467 (N); Hap-tröm 1006 (S, S); W. H. Harvey 405 (Bm); Zeyher 1365 (S). Natal: I. C. Verdoorn s.n. [8/12/20] (Ew). Transvaal: E. E. Galpin 9061 (Br); Obermeyer 30315 (Gg); Repton 1298 (Z); E. Wall s.n. [2/10/1938] (S); R. G. N. Young s.n. [22/5/27] (Hk). Province undetermined: W. H. Harvey 405 (T). MASCARENE ISLANDS: Mauritius: F. L. Hill M.1 (Bm). ARABIA: Yemen: Kuntz s.n. [11 Feb. '51] (W—1994907). TURKEY: Bornmüller 812 (B), 5516 (B); Fidao s.n. [En-

viron de Smyrne, Août 1904] (Ca--548204, N); Frivoldssky s.n. (W--264613); Kasapligil s.n. [8-7-1945] (Ca--938375); Tengwall 37 (S); Wiedemann s.n. [Anatolia] (Ob--14872). ISRAEL: R. Aaronsohn 359 (S); Jouannet-Marie 509 (Du); Kneucker 459 (B), 546 (B); Meyers & Dinsmore B.4441 [J.1588] (S), B.8141 [Cat. no. 1588] (S). JORDAN: Bornmüller s.n. [Gebirge Juda, Juli 1897] (B); Kasapligil 1679 (Ca--85086). SYRIA: Blanche 1541 (B, Br, Du, S, S), s.n. (Du); M. Martens s.n. (Br); Post 200 (W--805056); E. Wall s.n. [2/14/1932] (S). IRAQ: Bornmüller 1654 (B), s.n. [Basra, 23.III.1893] (B); Field & Lazar 516 (N), 806 (N), 967 (N); Lazar 486 (N), 3442 (S). IRAN: Bornmüller 5127 (B); Bruns s.n. [Teheran, 1909] (B); Field & Lazar 1125 (N); Pravitz 77 (S), 100 (S); K. H. Rechinger 1805 (W--2061437). PAKISTAN: Northwest Provinces: Duthie s.n. [Thinkiari, 29-8-99] (Gg--127009), s.n. [Hazara, 1.9.99] (Ca--294805); A. H. Kahn s.n. [Hazara district, 8.7.25] (W--1239955). Swat: Rodin 5424 (Ca--36600, W--2242319). NEPAL: Wallich s.n. (Cp). INDIA: Assam: Chand 3259 (Mi); Chatterjee s.n. [April 1902] (Br, Po--63870); T. L. Jenkins s.n. [Assam] (Bz--23770); Koelz 22817 (Mi). Chamba: Koelz 8806 (N). East Punjab: J. R. Drummond 26707 (Ca--244645); Koelz 1623 (Mi, N), 3046 (N), 4190 (Mi, W--1608020), 4769 (Mi, N, N, W--1608363), 7497 (Mi, W--1609748); Parmanand 337 (Mi); Ram 1740 (N); Schlagintweit 10233 (S); R. R. Stewart 19374a (N); T. Thomson s.n. [Lucknow, April 1858] (Br), s.n. [Panjab] (Br, M, S). Jammur & Kashmir: C. B. Clarke 22896 [603a] (W--802856); Collector undesignated 2227 (Xa); Gammie s.n. [Sunagar, 4.7.1891] (Ca--269794); Schlagintweit 4496 (S, W--804521). Uttar Pradesh: Blinckworth s.n. [In Kamoan] (M); Duthie 4282 (W--804935); N. Gill 77 (B); U. Singh 212 (Ca--361108, La, N); Strachey & Winterbottom s.n. [Kumaon] (Br); Vaid s.n. [30.6.49] (N); Wallich 1825/4 (Lu, S). State undetermined: Duthie s.n. (Ca--269794); Voigt s.n. (Cp, Cp, Cp). BURMA: Southern Shan States: Malaise 282 (S). Upper Burma: R. E. Cooper 6019 (Ca--170238). TIBET: Monbeig s.n. [1908] (S); Soulié 1075 (Bz--72846), s.n. [Tsekou] (B). CHINA: Anhwei: R. C. Ching 4123 [Herb. Univ. Nanking 8514] (Ca--261521, W--1370433). Chekiang: Barchet 553 (W--596114). Fukien: T. C. Chang 4447 (La); Chang & Metcalf 90 (Du--250191); J. H. Chen s.n. [Aug. 16, 1948] (N); Cheng 1821 (Bz--23783); Chung 3441 (Bz--23782); C. P. En 2022 (Du--250193), 2689 (Du--200936); Ging 7229 (Mi); Metcalf 997 (Um--61142); Metcalf & Chang 90 (Vi--128); Pi 6002 (Du--200935, Um--14); Po 12344 (Ur), 12491 (Ur); L. Y. Tai 11412 (Ur). Honan: L. H. Bailey s.n. [Sin-Tien, June 15, 1917] (Ba). Hupeh: L. H. Bailey s.n. [Hankow, June 10, 1917] (Ba); Cheo 83 [Herb. Univ. Nanking 18146] (Bz--23780); Chow 598 (N). Kiangsi: S. K. Lau



4280 (S, W--1752972), 4758 (S); W. T. Tsiang 9873 (N). Kiangsu: H. T. Chang 369 (Du--200934); E. Deschamps s.n. [Shanghai, Sept. 14, 1907] (W--595698); Tsu 658 (Ca--230126, V1, W--1346009), 658a (B1). Kwangsi: R. C. Ching 3272 (W--1508402), 5272 (Ca--409675, N); Steward & Cheo 513 (N, S), 929 (N); W. T. Tsiang 27635 (W--1757080). Kwangtung: N. J. Andersson s.n. [Whampoa, Dec. 1852] (S); Dahlstrom 254 (S); G. W. Groff 163 [Herb. Canton Chr. Coll. 11004] (Ca--288069); May 112 (Bz--23781); F. A. McClure 2595 [Herb. Canton Chr. Coll. 9153] (Oa); Pent, Tak, & Kin 680 [Herb. Canton Chr. Coll. 12679] (Ca--275057, S, W--1247932), 942 [Herb. Canton Chr. Coll. 12941] (Ca--274511, W--1248149); Ping 10622 (Bz--23779); T. Sampson s.n. [Canton, April 1884] (Bm); Tsang 20228 (N); S. W. Williams s.n. [Canton] (N); Wong 24 (Ba). Kweichow: Stewart, Chiao, & Cheo 52 (N); Tsiang 5059 (N), 5399 (N, S, W--1575158). Sikang: Chiao 1126 (S). Szechuan: C. L. Chow 7208 (W--1990615); Fang 3661 (N, W--1525366), 5201 (W--1671744), 5588 (W--1525367), 10222 (Du--289053), 12327 (Bm), 12438 (Bm). Yunnan: Enander s.n. [21/9/1926] (S), s.n. [24/9/1926] (S); Forrest 8036 (S); A. Henry s.n. [Szemao] (N); Maire 1561 (Ca--222894), 6181 (Ca--386801, S); Schoch 75 (W--1235269); H. Smith 1536 (Go, S); Tsai 53593 (S); Yu 10518 (Bm). Province undetermined: Dunn s.n. (Cp); F. B. Forbes s.n. [lawn, June 1, '79] (Bm); Hugh s.n. [Mt. Mias-Wang-san, north central China] (Bm); Osbeck s.n. [ca. 1750] (Lu), s.n. [China] (S). CHINESE COASTAL ISLANDS: Amoy: H. H. Chung 470 (Ca--420275); A. N. Steward 3059 (Ca--44778). Hainan: Chun & Tso 43471 (N); C. Ford s.n. [31.3. 93] (W--456231); Lau 1685 (N); C. I. Lei 231 (B, Ba, Bz--23777, Ca--611648, N), 942 (B, Ba, Bz--23778, Ca--612242, N, W--1754428); Liang 64870 (N); F. A. McClure 7590 [Herb. Canton Chr. Coll. 9153] (V1), 9153 [Herb. Canton Chr. Coll. 9153] (Ca--248680, Gg--127945), s.n. [Herb. Canton Chr. Coll. 9153] (B1); Tak 134 [Herb. Lingnan Univ. 15633] (Ca--315734), 753 [Herb. Canton Chr. Coll. 17502] (Du--250192); Tsang 134 [Herb. Lingnan Univ. 15633] (N), 753 [Herb. Lingnan Univ. 17502] (M1); Tsang, Tang, & Fung 200 [Herb. Lingnan Univ. 17731] (B1), s.n. [Herb. Lingnan Univ. 17831] (B1); Wu 1088 (Du--250190). Honam: C. O. Levine 488 (W--778811); E. D. Merrill 9906 (Ca--291698, Gg--31406). HONGKONG: C. Wright s.n. (W--71987). THAILAND: Smitinand 1689 (Ss); Suvarnakoses 1184 [Royal Forest Dept. 15131] (Sm). INDOCHINA: Annam: Eberhardt 4040 (B). Tonkin: Clemens & Clemens 3591 (Ca--339828); Pételot 1374 (N, W--1525838). KOREAN COASTAL ISLANDS: Quelpart: Kitamura s.n. [16 Jul. 1930] (M1). WESTERN PACIFIC ISLANDS: JAPAN: Honshiu: Baker & Baker s.n. [Kobe, May 18, 1915] (Gg--31398); Collector undetermined 360 (W--71988); Dorsett & Morse 886 (N, W--

1553469); Herb. Mus. Bot. Stockholm s.n. [Tokyo, 30/10/14] (S); Ichikawa 200678 (Ca--882672, S, W--1347459); J. Matsumura s.n. [Tokio, June 11, 1879] (W--147580). Ikishina: Hiroe 7336 (Ca--961561). Kiushiu: Ichikawa 200131 [Tanaka 47] (Ca--243938); Oldham 619 (Br, S, T); Takenouchi 1724 (W--1271674). Shikoku: Collector undesignated s.n. [Shimura, June 19, 1893] (W--206019), s.n. [Mosashi, 24 Juni 1910] (W--1178284); Herb. Sci. Coll. Imp. Univ. s.n. [June, Musashi] (Vt). Island undetermined: Burzes s.n. (S); Herb. Ames s.n. [June 19, 1893] (Oa); Herb. Lugd.-Bat. s.n. [1865] (M), s.n. (T); Noda s.n. (Po--128708); J. Petersen s.n. [Japan] (S); Thunberg s.n. [1777] (S). RYUKYU ISLAND ARCHIPELAGO: OKINAWAN ISLANDS: Okinawa: Boehmer 117 (N); Field & Loew 21t (Ca-745242, Mi), 96e (Bi); R. V. Moran 5066 (Bi, Ca--78420); Walker, Tawada, & Amano 5720 (N). FORMOSA: Baker & Baker s.n. [Keelung, Dec. 4, 1914] (Gg--31396); Faurie 372 (V--8193); Kuntz 33 (W--2336836); Sasaki 21397 (Ca--344389, La); Simada 885 (Ca--345123); T. Tanaka 11032 (Br, La, S); Tanaka & Shimada 11032 (B, Go, Mi, N, W--1577527). PHILIPPINE ISLANDS: Luzon: J. Clemens 17532 (N); M. S. Clemens 19003 (Bz--23767, Ca--295747); E. D. Merrill 305 (Bz--23768); M. Ramos s.n. [Herb. Philip. Bur. Sci. 7789] (N, W--629315), s.n. [Herb. Philip. Forest Bur. 7976] (Bz--23769); Ramos & Edaffo s.n. [Herb. Philip. Bur. Sci. 46562] (Br, Bz--23766, Ca--308974); Ramos & Ramos s.n. [Herb. Philip. Bur. Sci. 46562] (N). INDONESIA: GREATER SUNDA ISLANDS: Java: C. A. Baker 1909 (Bz--23765); Herb. Hort. Bot. Bogor. Ph.19 (Bz--26505). MELANESIA: NEW GUINEA: Northeastern New Guinea: Keogh s.n. [Mt. Wilhelm] (Ng--6576). AUSTRALIAN REGION: AUSTRALIA: New South Wales: Boorman s.n. [Cambewarra, 2.1910] (Bi); R. Brown s.n. [Port Jackson] (Bm); Collector undesignated 62 [Herb. Prager 18628] (Gg--31393); Hagman s.n. [1887--89] (Go); A. A. Hamilton s.n. [Menangle, 8-4-1912] (Ew); S. Helms 544 (W--1271320); B. Linder s.n. [15/10/1936] (S); F. Mueller s.n. [Darling River] (Bz--23775), s.n. [Junction of Murray & Darling Rivers] (Bz--23776, W--147581). Queensland: M. K. Clemens s.n. [Forest Hill, Jan. 1944] (Or--50745, Or--50746), s.n. [Oct.-Nov. 1945] (Or--53494, Or--53495, Or--53496); Michael 688 (Bz--23773); F. Mueller s.n. [Barcoo] (Bz--23774). South Australia: F. Mueller s.n. (Br). State undetermined: Herb. Martius s.n. [Austral. felix] (Br). NEW ZEALAND: North Island: Wilkes s.n. [Bay of Islands] (W--71985). POLYNESIA: NIUE: H. F. Moore 393 (W--653393); Yuncker 9645 (Bi, Bi, Ca--744061, Ca--948727, Dp-29046, W--1967969), 10145 (Bi, Dp--29047, W--2156478). CULTIVATED: Belgium: M. Martens s.n. (Br). California: Walther s.n. [June 1925] (Gg--128725). Canada: A. Blain s.n. [L. H. Bailey access. 6174-39] (Ba); Jard. Bot. Montreal Cult. Pl. 6174-39 [seed Yt 10518] (Mv). Chile: Looser 3996 (N). China: Liu L.831 (Ba),

L.2063 (Ba). Denmark: Herb. Liebmann s.n. (Cp); Herb. Mus. Bot. Stockholm s.n. [ex horto Havn.] (S); Herb. Schumacher s.n. (Cp); Herb. Vahl s.n. (Cp); Herb. Hort. Bot. Hafn. s.n. [Sept. 1860] (Cp). England: Herb. Linnaeus G.35, S.15 (N--photo of type, Z--photo of type), s.n. [Hort. Cliff. G.834, S.6; Hort. Bailey neg. 6407] (N--photo of type). France: Herb. W. H. Harvey s.n. [1819] (Du--166434). Germany: Herb. Calif. Acad. Sci. 31390 (Gg); Herb. Lemmon s.n. [22.8.1834] (Ca--366874). Italy: Herb. Harvey s.n. [ex seminib. h. R. P. 1841] (Du--166473). Java: Herb. Hort. Bot. Bogor. XV.K.A.XLIV.4 (Bz--26424), XV.K.A.XLV.9 (Bz, Bz--26436). Maryland: W. H. Cowgill 1730 [U. S. Plant Introd. 130416; seed YU 10518] (Oa--9235); McCann s.n. [9-15-36] (Md, Md, Md). New York: L. H. Bailey s.n. [Sept. 21, 1923] (Ba); G. V. Nash s.n. [17 S. 1898] (N). Spain: Herb. Hort. Matrit. 31 (Q), 47 (Q). LOCALITY OF COLLECTION UNDETERMINED: Bower s.n. [Sept.] (Ms); Capus s.n. (Ca--38875); Collector undesignated 376 (Br), K.11 (W--369584), s.n. [fin Août 1834] (Pr), s.n. (S); Freed s.n. [N. Am.] (S); Garrigues s.n. (M1); Herb. J. Angström s.n. [Dragerum, P. Sever] (S); Herb. H. R. Bassler s.n. [Graigns Point, Aug. 29, '79] (Ka); Herb. Bot. Bogor. 23771 (Bz); Herb. Coll. Pharmacy s.n. [9-47] (Pa), s.n. (Pa); Herb. Columbia Univ. s.n. [1841] (C); Herb. Linhaeus s.n. (S); Herb. Marie-Victorin s.n. [Monde] (V1); Herb. Mus. Bot. Stockholm 13 (S), s.n. [Majo 1849] (S), s.n. [Niulam] (S); Herb. Rafinesque s.n. [13.1.41] (N); Herb. Saldanha 2766 [Herb. Mus. Nac. Rio Jan. ref. V] (Ja); Herb. Schleicher s.n. (Ca--73654); Herb. U. S. Dept. Agr. s.n. (W); Knudsen XIV.2 [Schwirsen] (B); Matveeva 214 [Iter Lencoranicum] (N); C. T. Mohr 228 (W--771861); Née 80, in part (Q); Poeppig s.n. [N. Am.] (S); L. Schaeffer s.n. [Waldhof, 1886] (N); Simoda s.n. (W); A. Smith s.n. [Canavus] (Cp); Stewart s.n. [Campellpore] (Bz--23772); Trolander s.n. [5/7/1920] (Ew), s.n. [15 Aug. 1922] (Ew). MOUNTED ILLUSTRATIONS: Anon., fig. 625 (N); F. Bauer, Icon. Nov. Holl. 963 (V), 963a (V), s.n. (V); Brut. Mus. (Nat. Hist.) Brit. Flow. Pl. card F.80 (N); Bulliard, Plant. Médic. France pl. 215. 1780--1793 (N); H. N. & A. L. Moldenke, Pl. Life 2: pl. 5. 1948 (Z--negative), pl. 7. 1948 (Z--negative); Schubert, Naturg. Pflanzenreich, ed. 2, fig. 7. 1865 (N); Thornton, Brit. Fl. 1: 27. 1812 (N); Zannich., Istor. Piante Venez. pl. 269. 1735 (N).

VERBENA OFFICINALIS var. ALBIFLORA Strobl, Flora van Admont, Programme das Melker Gymnasium. 1882; Strobl, Oesterr. Bot. Zeitschr. 33: 406. 1883.

Synonymy: Verbena floribus albidis Vaill. apud Haller, Krm. Meth. Stirp. Helvet. 1: 661. 1742. Verbena communis, floribus albidis C. Bauh. apud Tourn., Inst. Rei Herb. 200. 1700. Verbena communis floribus albidis C. Bauh. apud Sabbat in Martelli, Hort.

Roman. 3: 11. 1775. Verbena officinalis f. albiflora Strobl ex Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241. 1927. Verbena officinalis f. albiflora Krause ex Moldenke, Résumé 371, in syn. 1959.

Bibliography: Dorsten, Botanicon 292. 1540; C. Bauh., Pinax Theatr. Bot., ed. 1, 269 (1623) and ed. 2, 269. 1671; Tourn., Inst. Rei Herb. 200. 1700; Haller, Enum. Meth. Stirp. Helvet. 1: 661. 1742; Dalibard, Fl. Paris. 9. 1749; Sabbat in Martelli, Hort. Roman. 3: 11. 1775; Strobl, Flora van Admont, Programme des Melker Gymnasium. 1882; Strobl, Oesterr. Bot. Zeitschr. 33: 406. 1883; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241. 1927; Moldenke, Résumé 130, 371, & 473. 1959; Moldenke, Résumé Suppl. 4: 15 (1962) and 6: 7 & 11. 1963.

This variety differs from the typical form of the species in having white corollas.

Strobl's original publication of this variety has not as yet been seen by me, nor do I know whether Krause ever validly published his f. albiflora. The type of Krause's trinomial, however, appears to have been collected by Ernst Hans Ludwig Krause (no. 28270) at Herrenstein, Germany, on August 11, 1907, and is deposited in the herbarium of the Botanisches Museum at Berlin. In his 1883 work Strobl says "Um Mascalucia [Etna] (Herb. Guss.). Blüht fast das ganze Jahr. 4."

This color form is first mentioned by Dorsten (1540), who says "Verbenae duo sunt genera, altera floribus est albis, altera verò coeruleis". Later it is referred to again by C. Bauhin (1623 & 1671), Tournefort (1700), Haller (1742), Sabbat (1775), and Dalibard (1749). Bauhin (1623) says "Genera ejus duo sunt Plinio l. c. foliosa, quam foeminam putant: mas rarioribus foliis, &c. folia minora quam quercus colos glaucus, &c. quidam unum omnino genus faciunt, quoniam utraq eodum effectus habeat, &c." Under his first species, "I. Verbena communis caeruleo flore", he makes the comment "Floribus est caeruleis, quandoque albidis."

Only a single specimen has been seen by me.

Citations: GERMANY: E. H. L. Krause 28270 (B).

VERBENA OFFICINALIS var. ANARRHINOIDES Murr, Allg. Bot. Zeitschr. 14: 19. 1908.

Bibliography: Murr, Allg. Bot. Zeitschr. 14: 19. 1908; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241. 1927; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 108 & 199. 1949; Moldenke, Résumé 130 & 473. 1959.

This variety differs from the typical form of the species in having 15--25 flowers blooming simultaneously on a single spike, the corollas somewhat paler and somewhat larger than in the typical form.

Murr's original description of this variety is "Verbena officinalis L. \*nov. var. anarrhinoides Mh. Corollis pallidioribus et paulo maioribus, floribus 15--25 (in typo 4--5) in una spica simul evolutis; forma lepida et habitu insignis. In mehreren Exemplaren an Ardetzenberg neben dem Typus." It comprises part of an article on the flora of the Tirol, Vorarlberg, and Liechtenstein.



The type locality, according to Dr. Karl Rechinger, is in Levis, Vorarlberg, Austria. Hegi describes the plant as "Blüten zu 15 bis 25 in einem einzigen Blütenstand vereinigt, etwas bleicher und etwas grösser als beim Typus."

It is known to me only from the literature.

*VERBENA OFFICINALIS* var. *BRACHYANTHA* Murr, Allg. Bot. Zeitschr. 16: 187. 1910.

Bibliography: Murr, Allg. Bot. Zeitschr. 16: 187. 1910; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241. 1927; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108 & 199. 1949; Moldenke, Résumé 130 & 473. 1959.

This variety differs from the typical form of the species in having all its flowers much smaller and the corolla-lip shorter.

Murr's original description of the variety is "Floribus omnibus multo minoribus limbo brevioribus. Ziemlich zahlreich unter dem Typus am Fuss des Ardetzenberges in Levis." This locality, according to Dr. Karl Rechinger, is in Vorarlberg, Austria. Hegi says "Blüten alle viel kleiner als beim Typus, Lippe kürzer."

It is known to me only from the literature.

*VERBENA OFFICINALIS* var. *GAUDICHAUDII* Briq., Ann. Conserv. & Jard. Bot. Genève. 10: 105. 1907.

Synonymy: *Verbena officinalis gaudichaudii* Briq. ex Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209. 1951.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genève. 10: 105. 1907; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 70 & 101. 1942; Moldenke, Alph. List Cit. 1: 226 (1946) and 2: 481. 1948; Moldenke, Castanea 13: 121. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 154, 164, & 199. 1949; Moldenke, Alph. List Cit. 3: 750. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Moldenke, Résumé 210, 224, & 473. 1959; Moldenke, Résumé Suppl. 3: 26 & 40 (1962) and 5: 6. 1962.

This variety differs from the typical form of the species in having the body of even the lower leaves linear-oblong and narrow.

An erect annual or "apparently perennial" herb, to 1 m. tall; stems several, erect, branched, from a "woolly" [=woody?] rootstock; leaves dull-green, paler beneath, the stem leaves elongate-lanceolate, narrow, to 7 cm. long and 8 mm. wide, deeply incised-dentate, the segments 2—5 mm. long, the upper leaves linear-lanceolate, sparsely and superficially dentate, the uppermost linear and subentire; corolla deep-blue, bluish, or lilac.

The type of this variety was collected by Charles Gaudichaud-Beaupré (no. 1144) at Port Jackson, New South Wales, Australia, and is deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva. Briquet (1907) says of it "Planta habitu a typo valde aliena, tamen vix segreganda."

The plant has been found on gray-brown clay in cleared brigalow scrub, on riverbanks, on granite formations, and growing as a weed of cultivated and fallow land, at 240 meters altitude, flowering

in January, April, September, and October, and fruiting in October. It has been misidentified and distributed under the names *V. caroliniana* L. and *V. officinalis* L. A common name for it in New South Wales is said to be "native tobacco". Everist found it to be a "weed around shed in pale-brown loam".

In all, 9 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: AUSTRALIA: New South Wales: E. F. Constable 11633 (W—1994884); Goode 92 (Bm); A. B. Oldfield s.n. (W—206864). Queensland: Everist 6101 (N); Pedley 377 (N); L. S. Smith 3045 (N). Victoria: A. Morrison s.n. [banks of Yarra River, Kew, 1/16/85] (Mi, N—photo, Z—photo). State undetermined: Herb. Coll. Pharmacy s.n. [Austral. felix] (Pa). CULTIVATED: Germany: Herb. Prager 18633 (Gg—31460).

VERBENA OFFICINALIS var. GRACILIS G. Cta. ex Moldenke, Résumé Suppl. 3: 15, nom. nud. 1962.

Bibliography: Moldenke, Résumé Suppl. 3: 15. 1962.

As yet I do not know where or when — or if ever — Gonçalves da Costa described this variety. Possibly the specimen cited below may represent the type collection, because on its label he has written "Sera-t-il une espèce nouvelle?" The variety is known to me only from this single specimen.

Citations: MADEIRA: Gonçalves da Costa s.n. [Porto Santo, Maio 1939] (Go).

VERBENA OFFICINALIS var. GRANDIFLORA Hausskn., Mittheil. Thüring. Bot. Ver., new ser., 10: 65. 1897.

Bibliography: Hausskn., Mittheil. Thüring. Bot. Ver., new ser., 10: 65. 1897; Moldenke, Résumé 131 & 473. 1959.

This variety differs from the typical form of the species in having its flowers almost twice as large, very remote on greatly elongated spikes, the calyx longer, and the corolla deep-blue.

The type of the variety was collected by Heinrich Carl Haussknecht along roadsides near Mount Korona, Greece. The plant is known to me only from the original description.

VERBENA OFFICINALIS var. MACROSTACHYA (F. Muell.) Benth. in Benth. & Muell., Fl. Austr. 5: 36. 1870.

Synonymy: Verbena macrostachya F. Muell., Fragm. 1: 60. 1858. Verbena officinalis var. macrostachya Benth. ex F. M. Bailey, Compreh. Cat. Queensl. Pl. 382. 1913. Verbena officinalis macrostachya Benth. ex Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209. 1951.

Bibliography: F. Muell., Fragm. 1: 60. 1858; Benth. & Muell., Fl. Austr. 5: 36. 1870; F. Muell., Syst. Cens. Austr. Pl. 102. 1882; F. M. Bailey, Cat. Indig. Nat. Pl. Queensl. 35. 1890; F. M. Bailey, Compreh. Cat. Queensl. Pl. 382. 1913; H. J. Lam, Verbenac. Malay. Arch. 10. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 74 & 101. 1942; Moldenke, Phytologia 2: 339.

1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 164, & 199. 1949; Moldenke, Alph. List Cit. 3: 667 (1949) and 4: 1248. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Moldenke, Résumé 132, 224, 369, & 473. 1959; Moldenke, Résumé Suppl. 3: 40 (1962) and 5: 6 & 7. 1962.

This variety differs from the typical form of the species in having its spikes uniformly elongated to 45.5 cm. and very coarsely glandular-puberulent or hirsute and the flowers rather larger. It is said to be a spreading herb, to 66 cm. tall, with pink corollas.

The type of the variety was collected by Ferdinand Jacob Heinrich von Mueller at Peak Downs, Queensland, Australia, in or before 1858. Bentham (1870) cites also a Bowman s.n. from Rockhampton, Queensland.

The Liu collection cited below was cultivated in Chihli, China, from seeds secured from Copenhagen, Denmark, where one may assume that the plant was also cultivated — the original source of the seeds is not known. It has been collected in flower and fruit in October. Herbarium material has been misidentified and distributed under the name V. officinalis L.

In all, 2 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: ALGERIA: Dukerly s.n. [Setif] (Br). CULTIVATED: China: Liu L.2063 (Ba, N—photo, Z—photo).

VERBENA OFFICINALIS f. MONTANA Goiran ex Moldenke, Known Geogr.

Distrib. Verbenac., [ed. 1], 45 & 101, nom. nud. 1942.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 45 & 101. 1942; Moldenke, Alph. List Cit. 1: 229. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108 & 199. 1949; Moldenke, Résumé 131 & 473. 1959.

Where or when -- if ever -- Goiran described this form is not as yet known to me, nor do I know where, when, and by whom the type collection was made. It is known to me only from the single specimen cited below.

Citations: ITALY: Gavioli s.n. [19.VI.1927] (N).

VERBENA OFFICINALIS var. PROSTRATA Gren. & Godr., Fl. Franç. 2: 718. 1852.

Bibliography: Gren. & Godr., Fl. Franç. 2: 718. 1852; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241. 1927; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Moldenke, Phytologia 2: 339. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 107, 108, & 199. 1949; Moldenke, Alph. List Cit. 3: 832 (1949) and 4: 1210. 1949; Moldenke, Résumé 129, 130, & 473. 1959; Moldenke, Résumé Suppl. 6: 7. 1963.

This variety differs from the typical form of the species in having prostrate stems.

The original description of the variety is "Verbena officinalis var. prostrata. Tige étalée-couchée.....sables des environs de Bayonne [France]." It is not known to me when or by whom the type was collected. It is possible that the Meissner 572 cited

by me hereinbefore under V. officinalis may actually represent this variety. Hegi (1927) describes it as "Stengel niederliegend." A common name is said to be "seruftit". Herbarium material has been misidentified and distributed under the names V. officinalis L. and V. supina L. The variety is known to me only from the following 7 specimens.

Citations: FRANCE: Collector undesigned s.n. (Du, Du). SWITZERLAND: Probst s.n. [13.9.36] (Pb). ERITREA: Pappi 2981 (W--1969120). ABYSSINIA: Schimper 145 (S, S, W--945092).

VERBENA OFFICINALIS var. RESEDIFOLIA Murr, Deutsch. Bot. Monatsschr. 20: 52. 1902.

Bibliography: Murr, Deutsch. Bot. Monatsschr. 20: 52. 1902; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2241--2242. 1927; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108 & 199. 1949; Moldenke, Alph. List Cit. 4: 1099. 1949; Moldenke, Résumé 130, 132, & 473. 1959; Moldenke, Résumé Suppl. 6: 7. 1963.

This variety differs from the typical form of the species in having its stem-leaves twice pinnately parted, with blunt rounded tips.

Murr's original description of the variety is "Stengelblätter doppelt fiederspaltig mit stumpfen gerundeten Zipfeln. Am Damme der Valsuganabahn bei S. Christoforo. Die Form, welche mir einen fremdartigen Eindruck machte, dürfte aus den vielbesprochenen griechischen Sämereien stammen." Dr. Rechingar states that this locality is now in the province of Alto Adige, in northern Italy (before World War I it was in Bozen, Bezirkshauptmannschaft Trient, Südtirol, Austria).

It is known to me only from the description and the single following specimen.

Citations: MOROCCO: E. Wall 7538 (Go).

xVERBENA OKLAHOMENSIS Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 78--79. 1942.

Synonymy: Verbena bipinnatifida Nutt. x V. canadensis (L.) Britton ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena canadensis (L.) Britton x V. bipinnatifida Nutt. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 11, 76, 78--79, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Alph. List Cit. 1: 157. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22. 1947; Moldenke, Alph. List Cit. 2: 515 & 517 (1948), 3: 822 (1949), and 4: 1085. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 21 & 199. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Am. Midl. Nat. 59: 357. 1958; Moldenke, Résumé 22, 26, 358, 360, & 473. 1959; Moldenke, Phytologia 8: 121 (1961) and 8: 210, 213, 214, 437, & 440. 1962; Moldenke, Résumé Suppl. 3: 6 & 7. 1962.

This hybrid has characters more or less intermediate between



those of V. canadensis (L.) Britton and those of V. bipinnatifida Nutt., with those of the latter predominating. The leaves are deeply bipinnatifid and the corollas are small and densely pubescent outside as in V. bipinnatifida, but the calyx and bractlets are finely appressed-pubescent or puberulent as in V. canadensis. The lower bractlets have their lower margins more or less strongly ciliate, but these marginal cilia are only dense and conspicuous on the lower portions of the lower bractlets and are very sparse or absent from the upper ones.

The type of the hybrid was collected by Dona Pitts sixteen miles east of Norman, Cleveland County, Oklahoma, on April 19, 1915, and is deposited in the herbarium of the University of Oklahoma. It was distributed as V. bipinnatifida Nutt. by the collector. Duplicate specimens of the type collection and other collections of the same taxon are mounted on the same sheets with V. canadensis and V. bipinnatifida under one label, indicating that the plant apparently grows in close association with the two parental species. This fact leads me to believe that it is an interspecific hybrid, rather than a mere form or variety of V. bipinnatifida. The two parent species grow together in at least 9 counties of Kansas, 2 of Arkansas, 19 of Oklahoma, 19 of Texas, one county each of Missouri, Indiana, and Nebraska, and 3 parishes of Louisiana, so it is very possible that this hybrid will be found more often. It may even account for some of the tremendous "variability" noted in herbarium material now usually regarded as one or the other of its parental species. The Pitts collection is a mixture of the hybrid with specimens of V. bipinnatifida, while the Van Vleet collection consists of a mixture with stems of V. canadensis, indicating, apparently, the very close proximity of at least one of the parental species in each case. The Demaree collection was originally identified as V. ciliata var. longidentata Perry, and was collected on sandy hills.

The hybrid has also been found in open or scrubby prairies and glades, on outcroppings of Cretaceous Annona Chalk, along roadsides and gravelly roadsides, in rocky railroad fill, on the top of limestone hills, in gravelly limestone, on rolling limestone prairies, along streams, in rich cork elm-hickory-oak woods on the Woodford Chert formation, in rocky xeric limestone gullies, and on outcrops of Arbuckle Lime formation, flowering and fruiting from April to June and in September.

The Stratton 4302, cited by me under V. bipinnatifida, looks a bit like xV. oklahomensis. Verbena demareei Moldenke, regarded by me hereinbefore as a synonym of V. bipinnatifida, seems to combine the ordinary leaf-characters of V. bipinnatifida with the large flowers of V. canadensis, and may possibly also prove to be a natural hybrid between these two species, perhaps in reverse form. Its flower-characters, however, are not the same as those seen in xV. oklahomensis. Even if it should prove to be the same hybrid, perhaps in reverse form, its name would not, in my opinion,

replace xV. oklahomensis, because it was originally proposed by me as a true species — not as a hybrid. My understanding of the International Rules of Botanic Nomenclature is that the oldest valid epithet must be used only if proposed in the same category of classification. My good friend, Conrad V. Morton, however, in a letter to me dated March 5, 1962, disagrees. He maintains that "There is nothing in the Code that would make this true. On the contrary, if V. demareei is prior then it would displace V. x oklahomensis, if the two are considered the same; whether one, or both, or neither was first proposed as a hybrid or a species is irrelevant." The plant should have considerable horticultural merit.

In all, 14 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: ARKANSAS: Little River Co.: Moore & Iltis s.n. [April 5, 1953] (Ok). OKLAHOMA: Carter Co.: M. Hopkins 6094 (Ca—882575). Cleveland Co.: Pitts s.n. [4/19/55] (N—photo of type, Ok—20477—isotype, Ok—20479—type, Z—photo of type). Comanche Co.: Van Vleet s.n. [Mt. Sheridan, 7/4/03] (Ok—10269). Murray Co.: Hopkins, Nelson, & Nelson 667 (St). Payne Co.: E. W. Michael 74 (St). Pontotoc Co.: Duffer 28 (St); D. McCoy 584 (St), 2479 (St), 2522 (St), 2539 (St). Tillman Co.: Demaree 12188 (Ok—20470). TEXAS: Lampasas Co.: Mahler 1241 (St).

VERBENA ORCUTTIANA Perry, Ann. Mo. Bot. Gard. 20: 284—285. 1933.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 247, 249, 250, 260, 284—285, & 355. 1933; A. W. Hill, Ind. Kew. Suppl. 9: 295. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 101. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 74. 1948; Moldenke, Alph. List Cit. 2: 519 (1948), 3: 779 (1949), and 4: 1126, 1127, 1243, 1244, & 1295. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 199. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 14. 1949; Moldenke, Résumé 39 & 473. 1959; Moldenke, Phytologia 10: 140. 1964.

Stems several from a common base, tetragonal in cross-section, branching, glabrous or very sparsely hirtellous, the hairs short; leaves decussate-opposite; petioles 1—2 cm. long, margined; leaf-blades lanceolate-elliptic to spatulate, 4—6 cm. long, tapering at the base into the petiole, coarsely serrate, rugose and appressed-pubescent above, more densely spreading-pubescent or hirtellous beneath and prominently veined; spikes pedunculate, solitary or somewhat paniced, strict, elongate, mostly dense-flowered, finely glandular, closely appressed-pubescent, the rachis more or less angulate; bractlets lanceolate-acuminate, shorter than the calyx, sparsely ciliate, the midrib and margins more or less decurrent along the rachis; calyx 4 mm. long, appressed-pubescent and finely glandular, the teeth short-subulate or acuminate, more or less connivent above the schizocarp after anthesis; corolla hypocrateriform, blue, its tube about as long as the calyx, the limb 3—4 mm. wide; cocci trigonous, 2 mm. long,

raised-reticulate at the apex, striate toward the base, the commissural faces extending to the tip of the nutlet, muriculate-scabrous.

The type of this endemic species was collected by Charles Russell Orcutt (no. 909) -- in whose honor it is named -- on tablelands at Hanson's Ranch, Baja California, Mexico, on July 30, 1883, and is deposited in the Gray Herbarium of Harvard University at Cambridge. The species has been collected on dry flats, tablelands, and mountains, at the margins of dry pools, and in mountain meadows, at altitudes of 4650 to 6000 feet, in flower and fruit in April, July, September, and October. The common name "verbena azul" is recorded for it. It has been misidentified and distributed in herbaria under the names V. littoralis H.B.K., V. officinalis L., and V. scabra Vahl. On the other hand, the Wiggins 4360, distributed as V. orcuttiana, is actually V. neomexicana var. hirtella Perry (or V. plicata Greene), and Carter, Alexander, & Kellogg 2135 is V. menthaefolia Benth.

The Gallegos 2342 specimens cited below have a photograph mounted on the same sheet with the specimen. A note on the United States National Herbarium specimen of Wiggins 5508 states that the inflorescence is not glandular.

In Plant Life (1948) it was stated that this species was named in honor of Heman Chandler Orcutt (1825--1892), but apparently this is not the case. There is no evidence that Perry did not intend the name to honor the collector of the type specimen, Charles Russell Orcutt (1864--1929).

Perry (1933) cites the following 3 additional specimens not as yet seen by me: MEXICO: Baja California: C. R. Orcutt 909 (G--type), s.n. [Hanson's Ranch, 29 July 1883] (G, N). She notes that "This species, which has been passing as V. littoralis, is much like V. neomexicana var. xylopoda in the finely glandular spike and the angle of insertion of the flowers. It differs, however, in the shorter nutlets, the smaller corollas, and the type of pubescence. In V. orcuttiana, the trichomes are short and somewhat hirtellous, and the pubescence of the inflorescence is closely appressed. In gross habit, it is scarcely to be distinguished from V. simplex, but the latter has somewhat harsher pubescence and larger non-glandular flowers." The C. R. Orcutt 118 cited hereinafter is what Perry cites as "Orcutt s.n. [Hanson's Ranch, 29 July 1883]" and his 521 is her s.n. from "mountains, northern Lower California, 8 July 1885".

In all, 20 herbarium specimens, including material of the type collection, and one mounted photograph have been examined by me.

Citations: MEXICO: Baja California: Gallegos 2342 (Me, W--1209871); C. R. Orcutt 118 (W--1323104), 521 (W--1323105), 909 (Cm--isotype, Pa--isotype), s.n. [Pinery, 7-27-1883] (Mi, W--56176), s.n. [Santa Catalina Mts., July 27, 1883] (Ca--104840), s.n. [7-31-1883] (Vt), s.n. [July 1883] (C), s.n. [7-8-1885] (I, Up--

17110, Vt); Wiggins 5508 (Du--265866, W--1824143), 9157 (Du--258545, W--1747513), 11258 (Du--321768, W--1976620).

VERBENA ORIGENES R. A. Phil., Linnaea 29: 20. 1857.

Synonymy: Verbena deserticola R. A. Phil., Fl. Atac. 40. 1860. Verbena palmata Reiche, Fl. Chile 5: 285 & 287. 1910. Glandularia origenes (Phil.) Schnack & Covas, Darwiniana 6: 475. 1944.

Bibliography: R. A. Phil., Linnaea 29: 20. 1857; R. A. Phil., Fl. Atac. 40. 1860; F. Phil., Cat. Pl. Vasc. Chil. 220 & 221. 1881; Hook. f. & Jacks., Ind. Kew. 1: 1178 & 1179. 1895; Reiche, Fl. Chile 5: 285, 287, & 289--291. 1910; Prain, Ind. Kew. Suppl. 4: 245. 1913; Sanzin, Anal. Soc. Cient. Argent. 88: 98, 127--129, & 134. 1919; Baeza, Nomb. Vulg. Pl. Silv. Chile, ed. 2, 100, 206, & 269. 1930; Stapf, Ind. Lond. 6: 430. 1931; R. Espinosa, Ökolog. Stud. Kordillerenpfl. 36 & 38. 1932; M. R. Espinosa Bustos, Rivadavia 327. 1938; Moldenke, Suppl. List Common Names 9 & 18. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 102. 1942; Moldenke, Alph. List Invalid Names 46 & 49. 1942; Schnack & Covas, Darwiniana 6: 475 (1944) and 7: 72. 1945; Moldenke, Phytologia 2: 116. 1945; Cabrera, Bol. Arg. Soc. Bot. 1: 67. 1945; Moldenke, Alph. List Cit. 1: 84. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; Moldenke, Alph. List Cit. 3: 688 & 813 (1949) and 4: 1115 & 1116. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 58--59. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 122, 296, 363, 371, & 473. 1959; Moldenke, Phytologia 8: 204 (1962) and 10: 113. 1964.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 128. 1919.

Perennial herb, to 40 cm. tall, robust, glandular-hispid or densely short-hairy, sometimes almost tomentose, yellowish-green; stems several, loosely tufted, from a matted caudex, upright, 15--60 cm. long, stout, trichotomously branched, leafless at the apex; leaves sessile, the uppermost smaller and forming a many-parted involucre beneath the inflorescence; leaf-blades trapezoid in outline, 3--4 cm. long and wide at the middle of the stems, usually broader than long, cuneate and somewhat clasping at the base, 3-parted to the middle or trifid, the segments ovate-triangular, acute at the apex, entire or 1--3-dentate, the margins sinuate; venation impressed above, prominent beneath; inflorescence terminal, consisting of a cluster of usually 3 many-flowered heads; flowers numerous; bractlets linear to awl-shaped, almost as long as the calyx, ciliate; calyx prismatic, about 8 mm. long, hispid, membranous between the 5 green ribs which terminate in short triangular teeth; corolla white or white-lilac to pink, lavender, or lilac, its tube about 10 mm. long, hairy on both surfaces, the limb often rose or blue, about 7 mm. wide, the 5 lobes obovate-cuneate, emarginate; cocci about 3.5 mm. long, red-brown, smooth on the back, the lateral angles narrowly alate.



The type of this distinctive species was collected by Claude Gay (no. 1906) in Coquimbo, Chile, a clastotype being preserved in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. The type of V. deserticola was collected by Rudolph Amandus Philippi (no. "1293") at Pogonal, Atacama, Chile, in February, 1854, and is no. 54764 in the herbarium of the same institution -- Macbride's type photograph 17434 being of an isotype in the herbarium of the Botanisches Museum at Berlin, now destroyed. Verbena palmata is based, apparently, on Peralta s.n. from Doña Ana, Reiche s.n. from Baños del Toro, collected in January, 1904, and on Volckmann s.n. from Río Turbio, collected in the summer of 1860--1861, all these localities being in Coquimbo, Chile, and all the specimens deposited at Santiago.

Morrison reports the species as "very common on rocky screes above the baños, Baños del Toro", Coquimbo. Johnston found it on dry benches at the foot of talus slopes in quebradas and "on talus slopes in gorge above baños" in Atacama. He distributed his no. 6102 as "V. deserticola var." Common names reported for the plant are "hierba del incordio", "rica-rica", "ricarrica", and "yerba del incordio", the first of which is also applied to V. laciniata (L.) Briq. The species has been found at altitudes of 3200 to 3800 meters, flowering from December to February, fruiting in February.

Reiche says of his V. palmata: "Difiere de V. cuneifolia R. & P. por el tallo mas corto, las hojas mas anchas que largas, las espigas mas costas e involucradas. La V. cuneifolia es del Perú, pero segun Gay V páj. 23 se observó tambien en las cordilleras entre Santiago i Mendoza." For the type of his species he seems to cite only one collection: "Cordilleras de Coquimbo (Dona Ana, valle superior del Rio Turbio)", but Acevedo de Vargas regards the three collections cited above as cotypes. She cites (1951) the following 12 specimens not as yet seen by me: CHILE: Atacama: Borchers s.n. [Baños de Inca, I.1886] (Sg--54762); F. Philippi s.n. [Quebr. de Paipote, 4-1-1885] (Sg--42465, Sg--54763, Sg--68387); R. A. Philippi s.n. [Pajonal, II.1854; Macbride photos 17434] (Sg--54764, Sg--photo). Coquimbo: Alamos s.n. [Cordillera de Los Patos, Aestate 1884] (Sg--42461); E. Gay 1906 (Sg--54769--clastotype); Peralta s.n. [Doña Ana] (Sg--54768); Reiche s.n. [Baños del Toro, I.1904] (Sg--54765, Sg--54767); Volckmann s.n. [Río Turbio, Aestate 1860--61] (Sg--54766).

In all, 22 herbarium specimens, including photographs of the type collection, and 4 mounted photographs have been examined by me.

Citations: CHILE: Atacama: I. M. Johnston 4844 (W--1497721), 5958 (W--1496088), 6102 (W--1495938); R. A. Philippi 1293 (W--1323079), s.n. [Pogonal, Feb. 1854; Herb. Mus. Nac. Hist. Nat. Chile 54764; Macbride photos 17434] (Kr--photo, N--photo, N--photo, N--photo); Werdermann 959 (Ca--314836, Gg--147374, N, S).

Coquimbo: Cabrera 3528 (N, N, S); M. R. Espinosa 24 (N); J. L. Morrison 17271 (Ca--630205, S); Wagenknecht s.n. [Baños del Toro, IX.1947] (Ew); Werdermann 225 (Ca--238314, Gg--34514, S, S, W--1233138). Ovalle: Tribarren s.n. [T. Meyer 4001] (N). Province undetermined: Herb. Mus. Nac. Hist. Nat. Santiago 6 (N).

VERBENA ORIGENES var. SEMPERI Moldenke, Phytologia 3: 44--45. 1948.

Bibliography: Moldenke, Phytologia 3: 44--45 (1948) and 3: 76. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 199. 1949; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 127 & 473. 1959.

This variety differs from the typical form of the species in having broadly ovate 3-parted leaves about 3 cm. long and 2.5 cm. wide, each division deeply lobed with rounded incised lobes, densely spreading-hirsutulous or scabrid-hirsute on both surfaces, the margins conspicuously revolute. The leaves are very similar to those of V. crithmifolia Gill. & Hook., but the inflorescence is that of V. origenes R. A. Phil.

The type of the variety was collected by Juan Semper -- in whose honor it is named -- at Quebrada de la Vacas, at an altitude of 2400 meters, in the department of Las Heras, Mendoza, Argentina, between March 2 and 20, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was distributed by Ruiz Leal, who describes the plant as "common", as his no. 4937. The plant has been collected in flower and fruit in February and March. The Miers 448, cited below, bears a notation "G. macrocephala", but to what genus the initial refers is not clear.

In all, 5 herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Mendoza: Miers 448 (Bm); Ruiz Leal 14629 (Z); Semper s.n. [Ruiz Leal 4937] (N--type). San Juan: Castellanos 15207 (W--2198245); F. A. Roig s.n. [Ruiz Leal 13010] (Ss).

xVERBENA OSTENI Moldenke, Phytologia 2: 323--324. 1947.

Synonymy: Verbena peruviana (L.) Britton x V. platensis Spreng. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena platensis Spreng. x V. peruviana (L.) Britton ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena teucrioides x chamaedryfolia Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena melindres x teucrioides Osten ex Moldenke, Résumé 369, in syn. 1959.

Bibliography: Moldenke, Phytologia 2: 323--324 & 337. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 26 & 27. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 100 & 199. 1949; Moldenke, Alph. List Cit. 3: 780. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Am. Midl. Nat. 59: 357. 1958; Moldenke, Résumé 120, 369, 372, 376, & 473. 1959; Moldenke, Phytolo-

gia 8: 121 (1961) and 10: 128. 1964.

A natural hybrid between V. peruviana (L.) Britton and V. platensis Spreng., with intermediate characters; stems slender, more or less densely short-pubescent, the younger parts spreading-pubescent or hirtellous; petioles about 1 mm. long, hirtellous; leaf-blades small, ovate, 1--1.5 cm. long, 4--9 mm. wide, coarsely dentate, pustulate-scabrous and very sparsely or more densely strigose-hirsutulous above, scattered-pubescent or hirsutulous beneath, especially on the larger venation; peduncles about 1.5 cm. long or almost obsolete, densely spreading-hirtellous with hair of several lengths; heads densely rather few-flowered; bractlets lanceolate, 5--6 mm. long, long-attenuate, densely short-pubescent, long-ciliate on the margins; calyx about 1 cm. long, densely hirsutulous, irregularly apiculate; corolla light-red, orange, or violet, its tube glabrous, about 15 mm. long, its limb about 15 mm. wide.

This natural hybrid apparently occurs sporadically where the ranges of the two parents overlap in Uruguay. The type was collected by Cornelius Osten (no. 3177, in part) -- in whose honor it is named -- at Coquimbo, growing with the two parental species, in the department of Soriano, Uruguay, on November 16, 1894, and is deposited in the herbarium of the Museo de Historia Natural at Montevideo. Osten, in a note written at Montevideo in January, 1931, says that "Der letztere [xV. uruguayensis Moldenke] ist übrigens, wie der spontane Bastard chamaedryf. (Melindres) x teucrioides Gill. sehr selten, was eigentlich Wunder nimmt bei der Häufigkeit der Eltern, die Leichtigkeit mit der sich die Verbenen künstlich kreuzen lassen." Osten describes its corollas as orange, but Herter calls them violet.

The plant inhabits dry sunny sandy fields, dry sandy soil, campos, serranias, and arroyos, at altitudes of 100 to 200 meters, blossoming in September, November, and January. Herbarium material has been misidentified and distributed under the names V. humifusa Cham., V. incisa Hook., and V. marrubioides Cham.

In all, 14 herbarium specimens, including the type, have been examined by me

Citations: URUGUAY: Castellanos s.n. [Herb. Inst. Miguel Lillo 15048] (N); Herter 1000 [Herb. Herter 82763; Herb. Osten 22625] (B, Ca--348972, N, S, Ug, W--1422050), 1000a [Herb. Herter 83913] (Ca--360220, N), s.n. [Valle Eden, IX.1928; Herb. Osten 20444] (Ug); Legrand 3491 (Ug); Osten 2977 (Ug), 3177, in part (N--isotype, Ug--type).

VERBENA OVATA Cham., Linnaea 7: 263--264. 1832.

Bibliography: Cham., Linnaea 7: 263--264. 1832; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Fl. 3: 602. 1843; Walp., Repert. 4: 19. 1845; Schau. in A. DC., Prodr. 11: 541. 1847; Schau. in Mart., Fl. Bras. 9: 187. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1058. 1904; Briq. in Chod. & Hassler,

Plant. Hassler. 10: 479. 1904; Molfino, Physis 7: 103. 1923; Herter, Florula 105. 1930; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 44, & 102. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 19. 1942; Schnack & Covas, Darwiniana 6: 470. 1944; Darlington & Janaki Ammal, Chromos. Atl. 270. 1945; Augusto, Fl. Rio Grande do Sul 232. 1946; Moldenke, Alph. List Cit. 2: 375 & 441 (1948), 3: 688, 863, 865, 921, & 922 (1949), and 4: 1257. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 106, & 199. 1949; Moldenke, Phytologia 3: 377. 1950; Moldenke, Am. Midl. Nat. 59: 353 & 354. 1958; Moldenke, Résumé 110, 118, 127, & 473. 1959; Lewis & Oliv., Am. Journ. Bot. 48: 641-642. 1961; Moldenke, Phytologia 8: 121, 126, & 127 (1961) and 9: 374 & 375. 1963.

Perennial herb, 1-1.6 m. tall; stems strict, mostly simple, 1 m. or more tall, tetragonal, scabrous on the angles, densely leafy to about the middle, subaphyllous above, issuing from perennial nodose roots, deeply canaliculate-sulcate, especially on the side alternate with the plane of the leaves, the margins obtuse or rounded; nodes annulate; lower internodes 3.5-8.5 cm. long, upper ones greatly elongate, to 28 cm. long; leaves decussate-opposite or approximate, sessile, coriaceous, very stiff, reticulate-veined and very rugose, shiny above and much roughened by bulbous-based hairs, subcanescent-hirtellous beneath and hispidulous on the venation, the lower ones broad for the genus, often  $1/3$  or  $1/2$  longer than the succeeding internode, broadly ovate or subrotund-ovate, 5.5-9 cm. long, 3-5.5 cm. wide, cordate at the base, semiamplexicaul and adnate, acute at the apex, unequally and coarsely dentate-serrate except at the very base, the teeth irregular, large and small ones interspersed, the larger ones often incised, acuminate; upper leaves (between the greatly elongate internodes) much reduced or even scale-like, triangular-acuminate or elliptic-lanceolate, 1-4 cm. long, 2-12 mm. wide, similar to the lower ones in texture and pubescence; venation deeply impressed above and very sharply prominent beneath, even to the tertiary veinlet reticulation; panicle terminal, cymose, compact, spreading-hirtous on its branches and peduncles, the spikes cylindric, 2-2.5 cm. long, usually ternate at the apex of the short branches of the panicle, the central one sessile, the lateral ones short-pedunculate; bractlets membranous, lanceolate, about 6 mm. long, 1-nerved, concave, slender, attenuate-acute, glabrous except for the ciliate margins, imbricate, about twice as long as the calyx, shiny, tinted with lilac when fresh, hiding the calyx; calyx during anthesis membranous, tubular, very slightly incurved, lightly 5-nerved, puberulent, the teeth very short, rounded, apiculate, ciliate, in fruit oblong, split, 3 times as long as the fruit, contracted above; corolla clear-blue or violet, twice as long as the calyx, its tube slightly surpassing the bractlets, subvillous-lanuginous outside, its limb exiguous; style slightly longer than the calyx, with a little terminal horn adjacent to the stigma; fruit regularly 6-seeded; cocci 2 mm. long, bright-fuscescent on the back, striate-ribbed, rather shiny, the commissural surface obtusely



angled, white-leathery; chromosome number:  $2n = 72$ .

The type of this very distinct and unmistakable species was collected by Friedrich Sellow (no. 3671) somewhere in "Brasiliæ meridionali" and was deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph no. 17435, but is now destroyed. Augusto (1946) states that Herter collected the species somewhere in southern Uruguay, but I have seen no Uruguayan material of it thus far. Noack (1937) reports that the chromosome number is  $2n = 72$ , the highest number known for the genus. Walpers (1845) places it in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Holophyllae, along with 22 other species. A natural hybrid of V. ovata with V. bonariensis L. is known as xV. intercedens Briq.

Verbena ovata has been found in bogs, swamps, and shrubby marshes, at altitudes of 850 meters, blooming in September and from November to February, fruiting in February.

Lewis & Oliver (1961), in discussing the probable genetic history of the genus, say that "It seems logical that the 2 sections are monophyletic and consequently that their basic chromosome numbers of 5 and 7 are derived from a common number of  $x = 6$ . Such a base number is known in the modern Verbenaceae, e.g., Priva. Not yet considered because of its debatable origin is V. ovata Cham. with its  $2n = 72$  chromosomes (Noack, 1937). This species, found in east-central South America, might have arisen as an amphidiploid in a cross between an  $n = 5$  and  $n = 7$  species followed by genomic doubling to reach this polyploid level. Dermen's (1936) inability to produce an intersectional hybrid, the rare occurrence of 1 parent in South America, and the unquestioned classification of V. ovata in the section Verbenaca (the taxon is not morphologically intermediate) are all evidences against such an origin. Alternately, V. ovata may be a terminal dodecaploid of an extant  $x = 6$  series which was morphologically more closely related to Verbenaca than to Glandularia. Additional cytological studies might reveal other 'relic' taxa in South America, but the very existence of V. ovata supports the hypothesis of an ancestral  $x = 6$  stock."

Herbarium material of V. ovata has been misidentified and distributed as V. litoralis H.B.K.

In all, 17 herbarium specimens, including the type collection, and 7 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Jürgens 442 (B); Rambo 9674 (Rb). Santa Catarina: Smith & Klein 11115 (N, W-2251752, Z). State undetermined: Sellow 3671 [Macbride photos 17435] (Br-isotype, F-photo of isotype, Kr-photo of type, N-photo of type, N-photo of type, N-photo of isotype, Si-photo of isotype, Z-photo of isotype). PARAGUAY: Fiebrig 5645 (W-1159391); Hassler 4695 (N). ARGENTINA: Misiones: Ekman 2032 (N, S); D. Rodriguez 596 [Herb. Inst. Miguel Lillo 31145] (Ca-3488, N), s.

n. [Herb. Mus. Argent. Cienc. Nat. 23779] (N); A. G. Schulz 6986 (Sz); G. J. Schwarz 1513 (N, S), 3673 (N).

*VERBENA PARAGUARIENSIS* Moldenke, *Phytologia* 1: 483--484. 1940.

Bibliography: Moldenke, *Phytologia* 1: 483--484 (1940) and 1: 511. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 41 & 102. 1942; Moldenke, *Alph. List Cit.* 1: 264 (1946) and 3: 869. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 99 & 199. 1949; E. J. Salisb., *Ind. Kew. Suppl.* 11: 263. 1953; Moldenke, *Résumé* 118 & 473. 1959.

Herb, to 60 cm. tall; stems usually simple and erect, strigose with closely appressed whitish antrorse hairs; leaves decussate-opposite, numerous, sessile, appressed to the stem; leaf-blades lanceolate, 6--23 mm. long, 1--3 mm. wide, attenuate above the rather sharply acute apex, rounded or obtuse at the base, entire and usually subrevolute along the margins, strigose on both surfaces like the stems; inflorescence terminal, spicate, terminating the stems, solitary, 10--20 cm. long, about 1 cm. wide throughout, many-flowered, the flowers alternate, imbricate, somewhat spreading; rachis slender, more or less flexuous, strigose like the stems; prophylla 2--3 mm. long, closely appressed to the calyx, strigose.

The type of this most distinctive species was collected by Teodoro Rojas (Hassler 9751) on a high plateau and in declivities in the Sierra de Amambay, Paraguay, in December, 1907, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. It is known only from the type collection, of which 7 herbarium specimens and 5 mounted photographs have been examined by me.

Citations: PARAGUAY: T. Rojas s.n. [Hassler 9751] (B--isotype, Bm--isotype, Cb--type, N--isotype, N--isotype, N--photo of type, N--photo of isotype, S--isotype, S--photo of type, V--isotype, Z--photo of type, Z--photo of isotype).

*VERBENA PARANENSIS* Moldenke, *Phytologia* 6: 331. 1958.

Bibliography: Moldenke, *Phytologia* 6: 331. 1958; Moldenke, *Résumé* 473 & 494. 1959; Moldenke, *Résumé Suppl.* 1: 7. 1959; Angely, *Fl. Paran.* 16: 79 (1960) and 17: 46. 1961.

Herb; stem apparently procumbent or decumbent and rooting, tetragonal, densely hirsute with fulvous-brown hairs; branches tetragonal, densely hirsute with fulvous-brown hairs; principal internodes 1--7 cm. long, elongated on the side branches; leaves decussate-opposite; petioles 1--3 mm. long, obscure, very densely hirsute like the branches; leaf-blades chartaceous, rounded-ovate, somewhat lighter beneath, 1--2.3 cm. long, 8--25 mm. wide, rounded in outline at the apex, more or less subcuneate or acute at the base, coarsely but regularly dentate along the margins with acute or subacute teeth, densely villous on both surfaces with long, brownish, more or less appressed hairs, the pubescence somewhat more grayish beneath; midrib very slender, impressed above, prominent beneath; secondaries slender, 3--5 per side, ascending,

hardly arcuate, impressed above, prominulous beneath; veinlet reticulation sparse, obscure on both surfaces; inflorescence terminal, subcapitate, densely villosulous throughout, many-flowered, the heads about 1.5 cm. long and wide; peduncles very slender, 1.5—3 cm. long, densely hirsutulous with fulvous-brown hair; calyx tubular, straight, about 3 mm. long, densely villosulous or hirsutulous on the outside, its rim 5-toothed, the teeth about 0.7 mm. long; corolla hypocrateriform, violet, its tube about 5 mm. long, densely barbate-tomentose in the throat, the limb 5-parted, about 2.5—3 mm. wide, the lobes obovate; stamens 4, included, didynamous, 2 inserted at about the middle and the other 2 above the middle of the corolla-tube; style glabrous, about 4 mm. long, included; stigma 2-lobed, only one lobe papillose.

The type of this remarkable species was collected by my good friend, Gert Hatschbach (no. 4214) in the campo along the road to Palmeirinho, in the municipality of Guarapuava, Paraná, Brazil, on November 15, 1957, and is deposited in the H. N. Moldenke herbarium at Yonkers, New York. The species is very distinct because of its capitate inflorescences and very small flowers.

My good friend, Dr. Angely, is of the opinion that the specific name of this plant should be written "paranaënsis". However, I see no valid reason for adding another syllable to names like this or "canadensis" or "virginiensis" simply because the state name from which they are derived terminates in an "-a" (Paraná, Canada, Virginia).

The species is known to me only from the type specimen.

Citations: BRAZIL: Paraná: Hatschbach 4214 (Z—type).

VERBENA PARODII (Covas & Schnack) Moldenke, Phytologia 2: 149. 1946.

Synonymy: Glandularia parodii Covas & Schnack, Revist. Argent. Agron. 11: 94—97, fig. 3. 1944.

Bibliography: Covas & Schnack, Revist. Argent. Agron. 11: 94—97, fig. 3. 1944; Covas & Schnack, Darwiniana 7: 86. 1945; Schnack & Covas, Darwiniana 7: 71, 72, 74, & 75, pl. 2 A & D. 1945; Moldenke, Phytologia 2: 149. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 75. 1948; Moldenke, Phytologia 2: 482. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 199. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 101 & 263. 1953; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 128, 296, & 473. 1959; Moldenke, Phytologia 8: 123 (1961) and 8: 396. 1962; Moldenke, Résumé Suppl. 3: 15 (1962), 5: 7 & 8 (1962), and 6: 7. 1963; Moldenke, Phytologia 9: 400 (1963) and 10: 136. 1964.

Illustrations: Covas & Schnack, Revist. Argent. Agron. 11: 95, fig. 3. 1944; Schnack & Covas, Darwiniana 7: pl. 2 A & D. 1945.

Annual or perennial prostrate herb, 5—15 cm. tall, forming small mats; stems creeping, rooting below, ascending at the apex, cylindric-quadrangular, densely pubescent, the hairs simple, rather rigid, erect or oblique, not appressed; leaves decussate-opposite; petioles 3—8 mm. long; leaf-blades triangular in out-

line, 1.5--2.8 cm. long, 1.2--2.5 cm. wide, laciniate, attenuate into the petiole at the base, the segments linear-lanceolate, 0.5--1.5 mm. wide, obtuse or subacute at the apex, not revolute along the margins, pubescent above and on the margins and on the venation beneath, the hairs simple, rigid, to 0.6 mm. long, oblique to subappressed; inflorescence terminal, spicate, often solitary, abbreviated during anthesis but elongating after anthesis; bractlets linear-lanceolate, more than half as long as the calyx, ciliate along the margins, subappressed-pilose on both surfaces; flowers very fragrant; calyx tubular, 7--8 mm. long, densely pubescent, the hairs simple, erect or oblique, not appressed; corolla hypocrateriform, varying from lilac, pale-lilac, rose, violet, or blue-violet to bluish, cream, or white, sometimes described as "yellow and violet", "rose and white", "white and bluish", "white and pink", or "white with patches of lilac", completely pubescent on the outer surface except for the portion covered by the calyx, pubescent also at the base of the lobes within; stamens typical for Glandularia, the two upper ones with a glandular appendage about 1 mm. long and 0.5 mm. wide, flattened, rounded at the apex, longer than the theca, exerted; gynoecium typical; ovary about 1 mm. long; style about 9 mm. long; cocci subcylindric, about 3.5 mm. long, obtuse at the apex, truncate at the base, the upper third reticulate on the dorsal surface; chromosome number:  $n = 5$ .

The type of this species was collected by Guillermo Covas and Benno Julian Christian Schnack (no. 2112) between Anchoris and Zapata, in the department of Tupungato, Mendoza, Argentina, on March 5, 1944. It is named in honor of Lorenzo Raimundo Parodi, distinguished Argentine educator and botanist.

The species has been collected along roadsides, on plains, in arroyos, at the edges of ditches, and on "paramillas", at altitudes of 850 to 3500 meters, flowering from October to May and in August, in fruit in December. Eyerdam, Beetle, & Grondona report it as "not common, in sandy loam, full sun, in a small garden, associated with Chenopodium." It has been misidentified and distributed in herbaria under the name V. erinoides Lam. The length of pistil related to size of pollen-grains is discussed by Covas & Schnack (1945). These authors state that the species is related to V. laciniata (L.) Briq. They give the following interesting notes: "Hemos hallado en la localidad del tipo una población formada, muy probablemente, por híbridos (y formas derivadas de éstos) entre esta especie y Glandularia mendocina.... La población híbrida presenta una amplia gama de variación que comprende formas intermedias y formas vecinas a ambos padres; en algunas de estas formas hemos podido observar flores con pequeños lóbulos petaloides en la base del limbo de la corola, carácter que nunca hemos observado anteriormente en el género Glandularia.... El polen de esta especie (observado en el ejemplar tipo) presenta cierto porcentaje de granos estériles. Además hemos observado, en individuos de la población híbrida mencionada, irregularidades en la meiosis (miembros de un par de cromosomas separados en diacinesis,



lo cual indica falta de homología en parte del material cromosómico).....En el misma población híbrida hemos encontrado una forma con flores rosadas, color aparentemente debido a un derivado de cianidina." This hybrid is discussed by me hereinafter under xV. perturbata Moldenke.

Schnack & Covas (1944) give the following key for the differentiation of V. parodii from its immediate allies:

1. Stems erect or suberect, not creeping.
2. Entire plant covered with a dense pubescence of mixed simple and glandulose hairs; leaves tripartite-pinnatifid.....V. perakii.
- 2a. Entire plant covered with a sparse pubescence of only simple hairs; leaves pinnatisect.....V. mendocina.
- 1a. Stems procumbent, rooting at the base, ascending at the tips.
3. Cocci 2 mm. long.
4. Bractlets one-third as long as the calyx; spikes not elongating after anthesis.....V. dissecta.
- 4a. Bractlets more than half the length of the calyx; spikes elongating after anthesis.....V. santiaguensis.
- 3a. Cocci more than 3 mm. long.
5. Corolla externally glabrous; glandular appendages of the anther connective subcylindric, scarcely visible from outside or included; pubescence appressed..V. laciniata.
- 5a. Corolla externally pubescent; glandular appendages of the anther connective much compressed, clearly exerted; pubescence composed or erect or oblique hairs.....V. parodii.

Herbarium material of V. parodii has also been misidentified and distributed as V. laciniata (L.) Briq. In all, 45 herbarium specimens have been examined by me.

Citations: ARGENTINA: Catamarca: Peirano s.n. [Cerillos; Herb. Inst. Miguel Lillo 32849] (N, Ug--4947). Chubut: Eyerdam, Beetle, & Grondona 24560 (Ca--656120). Mendoza: Araque Molina & Barkley 19Ar762 (N); Araque Molina & Paci 261 (N, S); Cáceres 4 (N); Carrette s.n. [Ruiz Leal 2565] (N); Carrette & Ruiz Leal s.n. [Ruiz Leal 7838] (N); Covas, Schnack, & Ruiz Leal s.n. [Ruiz Leal 9421] (N); Lourteig 772 [Herb. Inst. Miguel Lillo 113935] (Ca--166000, N); Melis & Barkley 20Mz012 (N); O'Donnell 1152 (N); Ruiz Leal 1167 (N), 1208 (N), 1507 (N), 2235 (N), 4373 (N), 4390 (R1), 4825 (N), 6165 (N), 6650 (N), 6888 (N), 5108 (N), 8465 (N), 8556 (N), 8700 (N), 9412 (N), 10488 (N), 11457 (Z), 13408 (Ss); Sanzín 632 [Herb. Osten 12814] (N, Ug), 800 [Herb. Osten 12809] (Ug), 3099 [Herb. Osten 14638] (Ug); Semper s.n. [Ruiz Leal 4345] (N), s.n. [Ruiz Leal 10212] (N), s.n. [Ruiz Leal 10302] (N, Ss). Salta: Venturi 6937 (W--1591503). Tucumán: Wall & Sparre s.n. [29/11/46] (Ew), s.n. [10/12/46] (Ew, Ew, N).

VERBENA PARVULA Hayek in Engl., Bot. Jahrb. 42: 162—163. 1908.

Synonymy: Verbena hirsuta Ruiz & Pav. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963 [not V. hirsuta Mart. & Gal., 1844].

Bibliography: Hayek in Engl., Bot. Jahrb. 42: 162—163. 1908; Prain, Ind. Kew. Suppl. 4: 245. 1913; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 40 & 102. 1942; Moldenke, Alph. List Cit. 1: 201 (1946), 2: 602 (1948), 3: 688 & 968 (1949), and 4: 1079. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 98, & 199. 1949; Moldenke, Phytologia 3: 74 & 75 (1949) and 5: 96. 1954; Moldenke, Résumé 81, 85, & 473. 1959; Moldenke, Résumé Suppl. 3: 13. 1962; Moldenke, Phytologia 8: 317, 321, & 412 (1962) and 9: 51, 151, & 296. 1963; Moldenke, Résumé Suppl. 6: 10. 1963.

Perennial herb to 38 cm. tall or decumbent, with straggling spreading habit to 45 cm. wide; roots thick, many-branched; stems woody, wiry, erect or arcuate-ascending, decumbent at the base, 6—10 cm. tall, sulcate-tetragonal, subsimple or branched, scabrous with appressed hairs; branches prostrate or appressed to the ground; leaves decussate-opposite, short-petiolate; leaf-blades oval or obovate, 1—1.4 cm. long, rather obtuse at the apex, contracted into the petiole at the base, irregularly incised-crenate or -serrate to almost pinnately lobed, appressed-setulose on both surfaces, linear-nervose on the lower surfaces; spikes terminal, simple or few-branched, at first narrowly conic, pointed, and head-like, later elongating as the seed forms; flowers small, sessile; bractlets ovate, subequaling the calyx, acute at the apex, setose-ciliate on the margins; calyx about 1.5 mm. long, very minutely setulose; corolla hypocrateriform, varying from blue, pale-blue, light-blue, or deep-blue to lilac, pale-purple, or purple, or even "pinkish-blue, white at base", 3 mm. long, subpuberulent on the outer surface.

The type of this species was collected by Karl Fiebrig-Gertz (no. 3415) in Tarija, Bolivia, in 1903 or 1904, and is probably deposited in the herbarium of the Naturhistorisches Museum in Vienna. Hayek says of it "Ein zierliches kleines Pflänzchen vom Habitus einer zwerghaften V. officinalis, aber schon durch die ganz anders gestalteten Blätter verschieden."

The species has been found on open or open rocky hillsides, in usually very dry waste or cultivated ground, and creeping in grass steppes. West found it near shrubs on the floor of rocky canyons, Asplund encountered it among weedy vegetation and in hard gravelly ground, and Ellenberg collected it in moist meadows with Festuca dolichophylla. The only common name recorded for it is "verbena". It has been found at altitudes of 600 to 4000 meters, flowering from February to May and in September & November, fruiting in February and March. It has been misidentified in herbaria and distributed under the names V. brasiliensis Vell., V. braziliensis Vell., V. cuneifolia Ruiz & Pav., V. hispida Ruiz & Pav., and V. litoralis H.B.K. West 8281 is a mixture with V. gracilescens (Cham.) Herter. A. S. Kalenborn 160 is erroneously

cited by me in my Alph. List Cit. 2: 602 (1948) as V. brasiliensis, as was Kalenborn & Kalenborn 160 in Phytologia 8: 321 (1962).

In all, 39 herbarium specimens, as well as 2 mounted photographs of the type, have been examined by me.

Citations: ECUADOR: Azuay: Asplund 17804 (S). Chimborazo: Asplund 20443 (S). PERU: Cuzco: Balls 6784 (Ca--683072, W--1777846); Cook & Gilbert 373 (W--603603); F. L. Herrera s.n. [Cuzco, July 1923] (W--1190015); F. W. Pennell 14184 (N). Junín: A. S. Kalenborn 160 (W--1044398); Kalenborn & Kalenborn 160 (N); Killip & Smith 21855 (N, W--1356976), 22142 (N, W--1357187); Kunkel 384 (Z), 386 (M1), 387 (M1), 390 (M1); Ledig 33 (W--1444172). Lima: Diers 982 (Ko); Killip & Smith 21541 (N, W--1356719). Puno: Ellenberg 250 (Ut--115394b). Tacna: H. H. Rusby 912 (C, Pa). Department undetermined: Hrdlicka s.n. [vicinity of Huarochiri, February 1913] (W--602735). BOLIVIA: Cochabamba: Steinbach 8729 (N, S), 8729a (W--1857441). El Beni: Buchtien 5887 (W--1134883); H. H. Rusby 908 (C, Pa). La Paz: Asplund 2303 (S, Us); Buchtien 135 (W--1177981); Hammarlund 167 (N), 196 (N). Tarija: J. West 8281, in part (Ca--565124); Fiebrig 3415 [Macbride photos 17436] (Kr--photo of type, N--photo of type). State undetermined: Kuntze s.n. [Bolivien, 600 m., 1/4 April 1892] (N, W--702210).

VERBENA PARVULA var. GIGAS Moldenke, Phytologia 7: 85. 1959.

Bibliography: Moldenke, Phytologia 7: 85. 1959; Moldenke, Résumé 425 & 473. 1959; Moldenke, Résumé Suppl. 1: 6. 1959; Soukup, Biota 3: 30. 1960; Moldenke, Résumé Suppl. 3: 13. 1962; Moldenke, Phytologia 8: 321 & 412. 1962.

This variety differs from the typical form of the species in having its stems erect, to 90 cm. tall, the internodes greatly elongated, and the leaves elliptic-ob lanceolate, to 7.5 cm. long and 2.5 cm. wide. The corolla is described as pinkish-white.

The type of the variety was collected by Albert Charles Smith and Ellsworth Paine Killip (no. 21925) on an open hillside at an altitude of 3000 to 3200 meters, at Tarma, Junín, Peru, between April 20 and 22, 1929, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has much of the aspect of V. litoralis H.B.K., but the inflorescence characters are those of V. parvula Hayek. It has been found in anthesis in April and June, and has been misidentified in herbaria as V. litoralis. Hammarlund 631 was incorrectly cited in Phytologia 8: 321 (1962) as V. brasiliensis Vell.

In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Cuzco: Hammarlund 631 (S). Junín: Killip & Smith 21925 (N--type); Kunkel 389 (Z).

VERBENA PAULENSIS Moldenke, Phytologia 3: 426--427. 1951.

Bibliography: Moldenke, Phytologia 3: 426--427 & 454. 1951; Moldenke, Biol. Abstr. 25: 3051. 1951; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959; Moldenke, Résumé 110 & 473. 1959.

Herb; stems slender, obtusely tetragonal, densely hirsute-pubescent with sordid-grayish hairs; nodes not annulate; principal internodes 0.8--2.5 cm. long; leaves decussate-opposite, sessile or practically so, ovate, 1.5--2.5 cm. long, 1.2--2.2 cm. wide, subacute at the apex, rounded or truncate at the base, coarsely and irregularly dentate along the margins, the lowest teeth almost lobe-like, rather densely hirsutulous-pubescent on both surfaces, especially beneath; midrib slender, impressed above, prominulous beneath; secondaries filiform, 4--7 per side, the lower ones issuing palmately from the base of the blade, impressed above, prominulous beneath, ascending, hardly arcuate; veinlet reticulation rather abundant, impressed above, prominulous beneath; inflorescence terminal, the spikes subcapitate, densely many-flowered, about 2 cm. long and wide during anthesis, sometimes with 2 or a few flowers slightly separate from the main head; peduncles abbreviated, mostly 1--1.5 cm. long, densely hirsutulous-pubescent; bractlets narrowly lanceolate, 7--8 mm. long, 1--1.5 mm. wide at the base, densely pubescent, attenuate at the apex; calyx cylindric, about 9 mm. long, strongly 5-costate, densely hirsutulous-pubescent or hirsutulous on the outside, its rim irregularly 5-subulate-toothed; corolla hypocrateriform, showy, its tube about 1 cm. long, very sparsely pilosulous on the outside, the limb almost 1 cm. wide.

The type of this species was collected by Edwin Friedrichs (no. 27901) in thickets at Campo do Jordão, São Paulo, Brazil, in January, 1944, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre, Brazil. In all, 3 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: São Paulo: Friedrichs 27901 (N--isotype, N-photo of type, Rb--type, Z--photo of type); Lanstyack s.n. [Herb. Rio de Janeiro 33107] (B).

VERBENA PAULSENI R. A. Phil., Anal. Univ. Chile 90: 607. 1896.

Synonymy: Verbena porrigens var. paulseni (R. A. Phil.) Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 59. 1951.

Bibliography: R. A. Phil., Anal. Univ. Chile 90: 607. 1896; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Reiche, Fl. Chile 5: 291. 1910; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 102 (1942) and [ed. 2], 102 & 199. 1949; Moldenke, Phytologia 3: 75. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 59. 1951; Biol. Abstr. 28: 904. 1954; Moldenke, Résumé 122, 372, & 473. 1959; Moldenke, Résumé Suppl. 4: 5 (1962) and 5: 6. 1962.

Suffruticose, procumbent, hirtous; stems ascending or erect; leaves 3-parted, rarely 5-parted-pinnatifid, about 2 cm. long and 1 cm. wide, the segments narrowly linear, revolute-margined, or almost filiform like the rachis of the blade, hardly 1 mm. wide,



obtuse at the apex, strigose; peduncles about 12 cm. long; spikes long-pedunculate, many-flowered, capitate; bractlets about 4 mm. long, half as long as the calyx, lanceolate, long-ciliate at the base; calyx hispid, 8 mm. long; corolla-tube glabrous, 11 mm. long, about 1 1/2 times the length of the calyx, dark-violet, pilose in the throat, becoming brownish in drying; anther appendages exerted, black.

The type of this little-known species was collected by the ornithologist, Ferdinand Paulsen — in whose honor it is named — near Quillota, Valparaíso, Chile, in September, 1885, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. Philippi states that the plant has the habit of V. sulphurea D. Don, but Acevedo de Vargas (1951) is of the opinion that it is a mere variety of V. porrigens R. A. Phil., in which opinion she may be correct. She says "Difiere del tipo por sus hojas más angostas y largas y por sus flores violáceas." She follows Durand & Jackson (1906) in dating Philippi's original work as "1895". She cites Médanos s.n. [Concan, 2.X.1884] (Sg—68378), not as yet seen by me. The photograph of the type specimen, in the Britton Herbarium, seems to have "1835" written on the label as the year of collection, rather than "1885" as stated by Acevedo de Vargas. Judging from this photograph, it is possible that the species is conspecific with V. cumingii Moldenke.

The species is said to have been collected by Grandjot at 1200 meters altitude near Santiago, Chile, where it had dark-red flowers and bloomed in November. It is known to me thus far only from the type photograph.

Citations: CHILE: Valparaíso: F. Paulsen s.n. [Quillota, Sept. 1885; Herb. Mus. Nac. Hist. Nat. Chile 54728] (N—photo of type).

VERBENA PERAKII (Covas & Schnack) Moldenke, Phytologia 2: 149—150. 1946.

Synonymy: Verbena erinoides var. glandulifera Sanzin, Anal. Soc. Cientif. Argent. 88: 129—133, fig. 34b. 1919. Glandularia perakii Covas & Schnack, Revist. Argent. Agron. 11: 89—91, fig. 1. 1944. Verbena dissecta f. glandulifera (Sanzin) Moldenke, Phytologia 2: 148. 1946.

Bibliography: Sanzin, Anal. Soc. Cientif. Argent. 88: 129—131, fig. 34b. 1919; Stapf, Ind. Lond. 6: 429. 1931; Covas & Schnack, Revist. Argent. Agron. 11: 89—91, 96, & 97, fig. 1. 1944; Schnack & Covas, Darwiniana 7: 71—75, pl. 1 C & 2 B. 1945; Covas & Schnack, Darwiniana 7: 86. 1945; Moldenke, Phytologia 2: 148—150. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 24. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106, 197, & 199. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 101 & 263. 1953; Moldenke, Résumé 127, 128, 296, 364, 471, & 473. 1959; Moldenke, Phytologia 8: 123 (1961) and 8: 378. 1962; Moldenke, Résumé Suppl. 4: 17—19 (1962) and 5: 6 & 7. 1962; Moldenke, Phytologia 9: 70, 131, 394,

& 400 (1963) and 10: 136. 1964.

Illustrations: Sanzin, Anal. Soc. Cientif. Argent. 88: 170, fig. 34b. 1919; Covas & Schnack, Revist. Argent. Agron. 11: 90, fig. 1. 1944; Schnack & Covas, Darwiniana 7: pl. 1 C & 2 B. 1945.

Perennial herb; stems erect or suberect, cylindric-quadrangular, pubescent with two kinds of hairs, the one type simple, to 1.5 mm. long, and erect, the other type to 0.5 mm. long and glanduliferous; leaves decussate-opposite; petioles 4--6 mm. long; leaf-blades ovate, tripartite-pinnatilobed, 2.4--3.8 cm. long, 1.5--2.2 cm. wide, attenuate into the petiole at the base, with obtuse lobes, pubescent especially above and on the venation beneath, the pubescence composed of simple hairs 0.2--1 mm. long and glanduliferous ones almost 0.3 mm. long; inflorescence spike, often solitary, abbreviated during anthesis, elongate after anthesis; bractlets lanceolate, more than half the length of the calyx, slightly pubescent on the veins, loosely ciliate on the margins; calyx tubular, almost 6 mm. long, composed of both suberect and glanduliferous hairs; corolla hypocrateriform, varying from purple, lilac, pinkish-lilac, lilac-rose, or rose, to violet or blue, sometimes described as "rose, drying violet", pubescent on the outer surface at and near the apex of the tube, glabrous on the upper part of the limb; stamens typical of Glandularia, the two upper ones with subcylindric glandular appendages, the thecae small, included; pistil typical; ovary 1 mm. long; style 8 mm. long; cocci subcylindric, almost 3 mm. long, obtuse at the apex, truncate at the base, reticulate on the upper central portion of the back; chromosome number:  $n = 5$ .

The type of this species was collected by Guillermo Covas (no. 2110) at Dique Papagallos, in the department of Las Heras, Mendoza, Argentina, on December 3, 1943, and is deposited in the herbarium of the Instituto de Botánica Darwinion at San Isidro, Argentina. The species is named in honor of Juan Tomás Perak (1916--1943), ill-starred Argentinian geneticist, who did noteworthy experimentation on the effects of colchicine on diploid species of cultivated plants and on the duplication of chromosomes, who obtained tetraploid maize, experimented on mutations induced by short-wave radiation, x-rays, and ultraviolet rays, and who died of radiation poisoning at the age of 27. The relation of the pistil length to pollen-grain size is discussed by Covas & Schnack (1945).

The species has been found in dry riverbeds, under pine trees on arid hillsides, and growing as a weed in cultivated soil, at altitudes of 820 to 1200 meters, blooming from August to February and in May, fruiting in December.

Verbena erinoides var. glandulifera was apparently based by Sanzin on his nos. 139, 1700, 3099, 3129, and 3130, collected about the city of Mendoza and exactly at the edge of the Cordillera at altitudes of 1000 to 1200 meters. He says of it: "Cerca de la ciudad de Mendoza, y precisamente del lado de la Cordillera a una altura de 1000 y 1200 metros, abunda una variedad (Herb. Sanzin 139, 1700, 3099, 3129, 3130), que lleva glándulas en el

cáliz y que tiene las hojas anchas, triangulares, de base cuneada y trifidas o tripartidas con los segmentos casi enteros o con unos lobulitos laterales: A typo differt caule, foliis, calicibusque hirsutis, pilis glanduliferis mixtis. Tubo calice subduplo longiore, appendicibus antherarum subexsertis clavatis violaceis. Laciniis foliarum lanceolatis (Osten, in litt.). Más al sur y a las mismas alturas indicadas existe otra variedad que se acerca más al tipo por sus hojas tripartido-pinatífidas con segmentos angostos, pero que se diferencia esencialmente por sus glándulas estaminales apenas salientes de la garganta del tubo corolar en vez de ser inclusas. La V. mendocina Phil. es intermediaria entre estas dos variedades, pues el examen de ejemplares auténticos de Philippi, del museo de Santiago, me permitió constatar que tiene hojas de dos clases, idénticas en la forma a las hojas de las dos variedades citadas. El carácter de los tallos erguidos de la V. mendocina, no es constante, pues en la variedad glandulifera hay individuos erguidos y otros semirastreros. Por todo esto me parece conveniente unir en una sola las dos especies, V. erinoides y V. mendocina." The Gray Herbarium's Card Index to New Species states erroneously that Sanzin's plant is from Peru and Brazil.

Covas & Schnack (1944) say "Esta especie fué descripta por Osten (ex Sanzin, en Anal. Soc. Cient. Argent. 88: 131, 1919) como Verbena erinoides var. glandulifera, pero evidentemente se trata de una buena especie que nada tiene que ver con Glandularia laciniata (L.) Schnack et Covas (= Verbena erinoides Lam.). En la clava que figura al final de este trabajo se podrán apreciar los principales caracteres diferenciales.....El polen de esta especie es normal. Consignamos esta observación porque en varias especies de Glandularia el polen es irregular, con granos normales y abortivos en porcentaje variable, pudiéndose también encontrar granos de polen con más de tres poros germinativos...G. Perakii posee flores relativamente grandes y de un atractivo color violáceo, por lo que merece ser introducida al cultivo."

Hybrids are known between V. perakii and V. peruviana (L.) Britton (=xV. tentamenta Moldenke), with V. santiaguensis (Covas & Schnack) Moldenke (=xV. gonzalezi Moldenke), and with V. tenuisecta Briq. (=xV. nisa Moldenke).

In all, 20 herbarium specimens have been examined by me.

Citations: ARGENTINA: La Rioja: Ruíz Leal 16293 (Z). Mendoza: H. H. Bartlett 19354 (M1); D. O. King 139 (Bm); Mexia 4372 (Ca--560623); Ruíz Leal 922 (N), 3330 (N), 3390 (N), 4477 (N), 6314 (N), 8453 (N), 9378 (N), 9503 (R1), 9504 (N); Sanzin s.n. [Ruíz Leal 1525] (N); Semper s.n. [Ruíz Leal 4158] (N), s.n. [Ruíz Leal 9538] (N), s.n. [Ruíz Leal 9849] (N). San Juan: Ruíz Leal 16388 (R1); Ruíz Leal & Roig 18956 (Ok). CULTIVATED: New York: H. N. Moldenke 18238 (N).

Synonymy: Verbena perenna Wooton ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Verbena perrenis Wooton ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. Bouchea perennis Wooton ex Moldenke, Résumé Suppl. 5: 6, in syn. 1962. Verbena perennis Woot. & Standl. ex Moldenke, Résumé Suppl. 5: 8, in syn. 1962.

Bibliography: Wooton, Bull. Torr. Bot. Club 25: 262. 1898; Thiselton-Dyer, Ind. Kew. Suppl. 2: 191. 1904; P. C. Standl., Contrib. U. S. Nat. Herb. 13: 161, 173, & 211. 1910; Glaz., Mém. Soc. Bot. France 3: 544. 1911; Perry, Ann. Mo. Bot. Gard. 20: 248, 260, 299--300, & 356. 1933; Steyermark & Moore, Ann. Mo. Bot. Gard. 20: 805. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 89. 1937; Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 16 & 31. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13--15, 19, & 102. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Alph. List Cit. 1: 126, 127, 154, 175, 182, 203, & 283. 1946; Moldenke, Phytologia 2: 328. 1947; Moldenke, Wrightia 1: 228. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 65. 1948; Moldenke, Alph. List Cit. 2: 401, 467, 469, 471, 477, 493, 506, 523, 525, 526, 532, 549, & 595 (1948), 3: 708, 729, 752, 768, 797, 843, 914, 939, 954, 965, 966, & 990 (1949), and 4: 1107--1110, 1121, 1122, 1141, 1150, 1240, & 1243. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24--26, 33, & 199. 1949; Moldenke, Résumé 29, 31, 32, 39, 372, & 473. 1959; Moldenke, Phytologia 8: 124. 1961; Lewis & Oliv., Am. Journ. Bot. 48: 639--641. 1961; Moldenke, Résumé Suppl. 3: 7, 8, & 40 (1962) and 5: 4, 6, & 8. 1962; Moldenke, Phytologia 8: 472 (1963) and 9: 113. 1963; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1239--1240. 1964.

Illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640. 1961.

Suffruticose perennial herb, 3--4 dm. tall; roots perennial; rootstock woody, heavy, perennial; stems several or numerous, from a woody base, varying from erect to ascending or divaricately ascending-erect, more or less strictly branched, glabrate or often finely glandular and slightly hispidulous with short stiff antrorse hairs, striate-angled; leaves predominately linear, 1--4 cm. long, entire or the lower ones 3-lobed to pinnately few-lobed, erect-ascending, sparsely hispidulous with short sharp stiff antrorse hairs, the margins revolute; spikes terminal, terminating the stems and branches, pedunculate, slender-filiform, elongate, loosely many-flowered; bractlets ovate, persistent, 1.5--3 mm. long, acute at the apex, hispidulous (or glabrate above), ciliate; flowers small, sessile, 7--8 mm. long; calyx tubular, 4--5 mm. long, herbaceous-ribbed, more abundantly pubescent along the ribs, hyaline and glabrous between the ribs, the teeth short-triangular, equal or subequal, acute; corolla hypocrateriform, varying from blue, deep-blue, or blue-lavender to purplish-blue, purplish-lavender, lavender, pink-lavender, or purple, its tube slightly longer than the calyx, pubescent, expanded just below the throat, forming a ring in which the almost



sessile anthers lie, the throat filled with hairs, the limb 5-parted, bilabiate, 5—7 mm. wide, the lobes elliptic, repand, the lower lip particularly undulate-margined; style short, included; stigma unequally 2-lobed, clavate; fruits more or less remote, 5-7 mm. apart on the rachis; schizocarp about 3 mm. long, strongly constricted along the lines of cleavage; cocci 4, cylindric or subcylindric, reticulate-scrubulate except at the base, glabrous, brownish, minutely retrorsely scabrous on the commissure, enclosed in the persistent fruiting-calyx, the commissural faces smooth or slightly scabrous and not extending to the tip of the nutlet; chromosome number:  $n = 7$ .

The type of this species was collected by Elmer Ottis Wooton (no. 187), growing in crevices of rocks at 1800 meters altitude along the road about two miles west of the Mescalero Agency in the White Mountains, Lincoln County, New Mexico, on July 21, 1897, and is deposited in the Britton Herbarium at the New York Botanical Garden. Standley (1910) states that the type locality is in Otero County, but Wooton's labels definitely are inscribed "Lincoln County". Wooton (1898) says that "This species is most nearly related to V. canescens H.B.K. var. neo-mexicana Gray, but may be easily separated from that variety (?) by the linear, generally simple revolute leaves and the peculiar pubescence."

The species has been found in limestone or calcareous stony soil, on rough grassy slopes and the slopes of canyons, on hills, flats, gravelly hills and hillsides, rocky slopes and ledges, low rocky ridges, banks, rocky hillsides, rocky limestone hills in the thorn-shrub-grassland community, calcareous ledges, and roadside prairies, on arid rocky hills, foothills, limestone hills, in juniper woodland and the juniper belt, and on calcareous gravel among scrub oaks, at altitudes from 3200 to 8000 feet, flowering from March to November, and fruiting from April to August and in October. Waterfall found it growing with Quercus, Juniperus, and Pinus in Culberson County, Texas; Janszen found it "in buff silt, alluvial cover, hilly topography"; and Mueller describes it as "sparse on grassy limestone slopes" in the same county and "infrequent" in Pecos County. Warnock avers that it is "infrequent" or "scattered" and also "abundant on hills" in Brewster County, and "frequent along highway in lower limestone slopes". Mueller found it "scattered on limestone on brow of canyon" in Hudspeth County, while McVaugh encountered it in "rocky limestone hills, abundant in thorn-shrub-grassland community" in Pecos County. Mueller found it "sparse on rocky arroyo banks" in Coahuila. In Shreve & Wiggins (1964) it is said to be found "On rough grassy slopes, gravelly or rocky hillsides, flats, canyons, and low rocky ridges, Sonoran to Transition Zones, western Texas to Pima County, Arizona, and to Coahuila."

The M. S. Young collection cited hereinafter appears to represent a form with very large corollas, and is so noted also by the collector. It is perhaps worthy of nomenclatural recognition, but evidence from many other specimens indicates that the flowers vary in size and apparently shrivel quickly after being picked and

before being pressed. Tharp 3682 exhibits corollas that are intermediate in size.

Glaziou (1911) cites his no. 17716a from São Paulo, Brazil, as "V. perennis Woot." with a question, and describes it as an herb with white flowers, blooming in August and September. What his plant really is, I cannot as yet say, since I have not as yet seen any material of the collection; his 17716 is cited by him as V. ephedroides Cham.

Herbarium material of V. perennis has been misidentified and distributed in herbaria as V. canescens H.B.K., V. halei Small, V. menthaefolia Benth., V. neomexicana (A. Gray) Small, V. neomexicana var. hirtella Perry, V. xutha Lehm., Bouchea linifolia A. Gray, Buchnera elongata Sw., and Lobelia sp.

Perry (1933) cites the following 17 additional specimens not as yet seen by me: TEXAS: Culberson Co.: Clarke 4250 (E); Havard 197 (G); Moore & Steyermark 3611 (E); M. S. Young s.n. [Guadalupe Mts., 8/13/16] (E). Martin Co.: G. E. Seler s.n. [Loyola, 5 Nov. 1902] (G). NEW MEXICO: Eddy Co.: Wooton s.n. [Queen, Aug. 1909] (E). Lincoln Co.: F. S. Earle 387 (E); J. Skehan 20 (E, F, G); Wooton 187 (E--isotype, G--isotype), s.n. [Ruidosa Creek, Aug. 5, 1901] (E). Otero Co.: P. C. Standley s.n. [17 Aug. 1899] (W). Sierra Co.: O. B. Metcalfe 1568 (E, F, G). She makes the following comments: "The relationship of this species is somewhat anomalous. The lobing of the leaves and the character of the nutlets seem to ally it with V. canescens and its relatives; whereas the pubescence and the predominance of practically entire linear-oblong leaves recall V. simplex. It could scarcely be confused with either, since the character combination of an open spike, very narrow leaves, and sparsely short-strigillose hairs is not found elsewhere in the group under consideration."

In all, 144 herbarium specimens and 1 mounted clipping have been examined by me, including the types of all the names involved.

Citations: TEXAS: Brewster Co.: Cory 30082 (N); G. L. Fisher s.n. [Alpine, Aug. 24, 1932] (Hp, Wi); D. C. Ingram 2736 (Ar--14794, Mi, W--1489829); Parks & Cory 18504 (Tr--16173); O. E. Sperry T.125 (Om, W--1679248), T.563 (Fs, Om, W--1766437), T.564 (Om), T.813 (Om); Steiger 20 (N), 1066 (N), 1248 (N); Tharp 3682 (Au, W--1289910); B. H. Warnock 287 (Au), 4650/5982 (Au--122395), 21090 (Au), 21205 (Au), 21279 (Au), 21827 (Al, Ca--882787, Du--327912, N, N, Ok, S, Ur), W.169 (N), W.282 (N), W.287 (N); Warnock & Hinckley 3926 (N); Whitehouse 18633 (Mi). Culberson Co.: Correll & Johnston 22006 (Id); Correll & Rollins 23897 (Id); Hinckley 4441 (N, W--2005460); Janszen 424 (Au--122401); C. H. Muller 8253 (Rf, Sm); Ripley & Barneby 11151 (Gg--382617, N); Smith & Robertson 217 (Ar--305860); Waterfall 3795 (N, St, Tu--128570), 4510 (Au, N), 5209 (Gg--316101, N, Ok, Sm, St, St);

Whitehouse 8742 (Au), 15968 (Sm), 17019 (Mi, N), s.n. [Signal Peak, 7.5.31] (Au); M. S. Young s.n. [Guadalupe Mts., 8/13/16] (Au, Au). Hudspeth Co.: C. H. Muller 8214 (Rf, Sm, St); Turner, Tharp, & Warnock 3233 (Au—122397). Jeff Davis Co.: E. D. Schulz s.n. [Davis Mts., 8/2/1928] (Wi). Pecos Co.: Hinckley 4839 (W—2095622); R. McVaugh 7935 (Ar—233930, Au—178252, Du—355386, Mi); B. H. Warnock 13448a (Au—123222, Rf). NEW MEXICO: Chaves Co.: G. J. Ikenberry 376 (St). Eddy Co.: V. Bailey s.n. [Carlsbad Cave, April 1934] (W—1220145); Cory s.n. [Carlsbad, 4-24-1924] (Tr), s.n. [Carlsbad, 4-23-1925] (Tr); O. Degener 5038 (Ms, N); Havard s.n. [Guadalupe Mts., Oct. 1881] (W—147569, W—218869); Hershey s.n. [Guadalupe Mts., 5/12/39] (Bt—59779); A. Nelson 11406 (Ca—500718, Du—218829, S, Um—17, Up); P. C. Standley 40686 (W—1222072); Wilkins 1568 (En); Wooton s.n. [Queen, Aug. 2, 1909] (W—564654), s.n. [Queen, Aug. 3, 1909] (W—564653). Guadalupe Co.: Arsène & Benedict 16656 (W—1033519). Lincoln Co.: F. S. Earle 619 (N); Earle & Earle 387 (N, Po—63866, W—382530), s.n. [Lincoln, 7/31/1900] (N); Eggleston 18910 (N); Goodman & Waterfall 4967 (Ok); Hitchcock, Rethke, & Raadshooven 4202 (Ca—603911, Du—256977, En, Gg—308138, Io—146632, La, Pl—90851, Se—18241, Se—44887, Ua—28658); E. L. Reed 3655 (Bl—42331, I); J. Skehan 20 (Ca—25153, Cm, Ka, N, N, Po—64646, W—350138), 1316 (Ca—882788); Wooton 187 (Ca—124666—isotype, Ka—isotype, N—type, Po—70679—isotype, W—736221—isotype), s.n. [Ruidoso Creek, Aug. 5, 1901] (S, W—736874). Otero Co.: W. V. Fisher s.n. [August 20, 1950] (St); Wooton s.n. [Tularosa Creek, Aug. 19, 1899] (W—563953, W—736875). Sierra Co.: O. B. Metcalfe 1568 (Gg—31386, N, Vi, W—890290). ARIZONA: Pima Co.: M. E. Jones 24994 (Po—192935). MEXICO: Coahuila: E. G. Marsh 859 (Au), 1378 (Au—213159, St); C. H. Muller 3045 (Ca—720147, Mi, Rf). MOUNTED CLIPPINGS: Bull. Torr. Bot. Club 25: 262. 1898 (W).

VERBENA PERENNIS var. JOHNSTONI Moldenke, Phytologia 2: 150. 1946.

Synonymy: Verbena shrevei Johnston ex Moldenke, Phytologia 2: 150, in syn. 1946.

Bibliography: Moldenke, Phytologia 2: 150 (1946) and 2: 331 & 384. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 65 & 83. 1948; Moldenke, Alph. List Cit. 2: 370 & 497 (1948), 3: 963 (1949), and 4: 1246. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 199. 1949; Moldenke, Résumé 39, 374, & 473. 1959; Moldenke, Phytologia 8: 473. 1963.

This variety differs from the typical form of the species in having its stems, leaves, and rachis densely spreading hirtellous, the leaves to 5 cm. long, the lowermost often with several linear lobes. The corolla is described as blue-purple.

The type of the variety was collected by L. R. Stanford, Ken-

neth Lynn Retherford, and R. D. Northcraft (no. 915) among varied vegetation of large shrubs, small trees, and herbs, in a broad damp riverbed, at an altitude of 1950 meters, 12 kilometers northwest of Palmillas on the road to Miquihuana, Tamaulipas, Mexico, on August 14, 1941, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was originally distributed as V. shrevei by Ivan Murray Johnston (1898-1960), expert on the Boraginaceae and temperate South American plants, in whose honor it is named. By his specific epithet, Dr. Johnston meant to honor Forrest Shreve (1878-1950), distinguished American ecologist and plant collector in northern Mexico and southwestern United States.

The variety has been found at altitudes of 1950 to 2500 meters, flowering in August. It has been misidentified and distributed in herbaria as V. neomexicana (A. Gray) Small, V. neomexicana var. hirtella Perry, and V. neomexicana var. xylopoda Perry. Stanford, Retherford, & Northcraft 486 is a mixture with V. canescens H.B.K. and (perhaps) with V. neomexicana var. hirtella Perry. Their no. 507 may actually have been collected in Coahuila, since the label is not definite. Shreve & Tinkham 9728 was distributed as "Verbena n. sp." and was collected "in the pinyons" at 6900 feet altitude, flowering and fruiting in August.

In all, 8 herbarium specimens, including the types of both names involved, have been examined by me.

Citations: MEXICO: Coahuila: Stanford, Retherford, & Northcraft 486, in part (Du-288703, N). Nuevo León: Herb. Inst. Biol. Univ. Nac. Mex. 2375 (Me), 7138 (Me); Shreve & Tinkham 9728 (Tu-125740). Tamaulipas: Stanford, Retherford, & Northcraft 915 (N-type, Tu-15150--isotype). Zacatecas: Stanford, Retherford, & Northcraft 507 (Tu-10909).

xVERBENA PERPLEXA Moldenke, Résumé Suppl. 4: 4, 14, & 16, hyponym (1962); hybr. nov.

Synonymy: Verbena gooddingii Briq., x V. bipinnatifida Nutt. ex Moldenke, Résumé Suppl. 4: 16, in syn. 1962. Verbena bipinnatifida Nutt. x V. gooddingii Briq. ex Moldenke, Résumé Suppl. 4: 14, in syn. 1962.

Bibliography: Moldenke, Résumé Suppl. 4: 4, 14, & 16. 1962; Moldenke, Phytologia 8: 378 & 381. 1962.

Planta hybrida aspectu V. bipinnatifida et V. gooddingii intermedia; foliis inciso-pinnatifidis utrinque hispidis; inflorescentiis terminalibus multifloris congestis dense albo-hirsutis; bracteolis calycem excedentibus albo-hirsutis.

Herb, apparently a natural hybrid between V. bipinnatifida Nutt. and V. gooddingii Briq., with intermediate characters; stems rather slender, tetragonal, white-hirsute throughout, less densely so in age; principal internodes 1.5-4.5 cm. long; leaves decussate-opposite, usually with abbreviated leafy shoots in their axils; pet-



ioles about 1 cm. long, winged, white-hirsute; leaf-blades incised-pinnatifid, rather densely white-villous on both surfaces; inflorescence terminating the branches, erect, many-flowered, congested, at least during anthesis, conspicuously and densely white-villous; peduncles 2—5 cm. long, densely white- and spreading-villous; bractlets elongate, narrow, lanceolate, equaling or surpassing the calyx, mostly 10—12 mm. long, densely white-villous on both surfaces; calyx tubular, 8—10 mm. long, densely white-villous, the rim subulate-toothed, the teeth unequally elongate; corolla-tube equaling or somewhat exserted from the calyx, densely white-pubescent outside above the calyx-tube, the limb about 5 mm. wide.

The type of this hybrid was collected by Robert A. Darrow five miles south of Patagonia, Santa Cruz County, Arizona, on March 20, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has been collected at an altitude of 5200 feet, flowering in March and April. It has been misidentified and distributed in herbaria as V. bipinnatifida Nutt., V. gooddingii Briq., and V. macdougalii Heller. Only 2 herbarium specimens, including the type, have been examined by me.

Citations: ARIZONA: Cochise Co.: G. Martin s.n. [April 12, 1960] (Hi—194950). Santa Cruz Co.: Darrow s.n. [March 20, 1938] (N—type).

xVERBENA PERRIANA Moldenke, Revist. Sudam. Bot. 4: 19. 1937.

Synonymy: ?Verbena laciniata Raf., Herb. Raf. 61, nom. nud. 1833 [not V. laciniata Briq., 1960, nor Kuntze, 1941, nor (L.) Briq., 1904, nor (Lam.) Briq., 1939, nor Sessé & Moc., 1940]. Verbena bracteoso-urticaefolia Engelm., Am. Journ. Sci. 46: 101. 1844. Verbena urticaefolio-bracteosa Engelm., Am. Journ. Sci. 46: 101. 1844. Verbena bracteosa x hastata Webber, Trans. Acad. St. Louis 6: 40. 1892. Verbena bracteosa x hastata Rydb., Fl. Rocky Mts. 740. 1917. Verbena bracteosa x urticifolia Rydb., Fl. Cent. N. Am. 678. 1932. Verbena bracteosa x hastata Mackenzie ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena bracteosa x stricta Britton ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena bracteosa x urticaefolia Mackenzie ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena bracteosa x urticifolia Eggert ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena bracteoso-stricta Engelm. ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena hastata x bracteosa Rydb. ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena officinalis x bracteosa Barnes ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena stricta x bracteosa A. S. Hitchc. ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena stricta x urticifolia Stevens (in part) ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. Verbena stricto-bracteosa

Engelm. ex Moldenke, *Revist. Sudam. Bot.* 4: 19, in syn. 1937. *Verbena urticifolia* x *bracteosa* Eggert ex Moldenke, *Revist. Sudam. Bot.* 4: 19, in syn. 1937. *Verbena bracteata* Lag. & Rodr. x *V. urticifolia* L. ex Moldenke, *Prelim. Alph. List Invalid Names* 45, in syn. 1940. *Verbena bracteata* x *hastata* Gates, *Fl. Kans.* 190. 1940. *Verbena bracteata* x *urticifolia* Gates, *Fl. Kans.* 190. 1940. *Verbena bracteata* x *stricta* Schneck ex Moldenke, *Suppl. List Invalid Names* 8, in syn. 1941. *Verbena bracteosa* x *stricta* Palmer ex Moldenke, *Suppl. List Invalid Names* 8, in syn. 1941. *Verbena bracteosa* x *stricta* Schneck ex Moldenke, *Suppl. List Invalid Names* 8, in syn. 1941. *Verbena hastata* x *bracteosa* Schneck ex Moldenke, *Suppl. List Invalid Names* 8, in syn. 1941. *Verbena bracteosa* x *stricta* Clothier ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 22, in syn. 1947. *Verbena bracteosa* x *urticaefolia* Carleton ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 22, in syn. 1947. *Verbena bracteosa* x *urticaefolia* Deam ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 22, in syn. 1947. *Verbena bracteosa* x *urticifolia* Stevens ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 22, in syn. 1947. *Verbena urticifolia* x *bracteata* Gates ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 27, in syn. 1947. *Verbena urticifolia* L. x *V. bracteata* Lag. & Rodr. ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 27, in syn. 1947. *Verbena urticifolia* x *bracteosa* Patterson ex Moldenke, *Alph. List Invalid Names Suppl.* 1: 27, in syn. 1947. *Verbena bracteo-hastata* Hall ex Moldenke, *Résumé* 359, in syn. 1959. *Verbena urticifolio-bracteosa* Engelm. ex Moldenke, *Résumé* 378, in syn. 1959. *Verbena brachiata* Nieuwl. ex Moldenke, *Résumé Suppl.* 6: 10, in syn. 1963.

Bibliography: Raf., *Herb. Raf.* 61. 1833; Engelm., *Am. Journ. Sci.* 46: 101. 1844; Webber, *Trans. Acad. St. Louis* 6: 40. 1892; E. J. Palmer, *Ann. Mo. Bot. Gard.* 3: 292. 1916; Rydb., *Fl. Rocky Mts.* 740. 1917; Wolden, *Proc. Io. Acad. Sci.* 39: 123. 1932; Rydb., *Fl. Cent. N. Am.* 678. 1932; Moldenke, *Revist. Sudam. Bot.* 4: 19. 1937; Gates, *Fl. Kans.* 190. 1940; Moldenke, *Prelim. Alph. List Invalid Names* 45—48. 1940; C. C. Deam, *Fl. Indiana* 798 & 1232. 1940; Moldenke, *Suppl. List Invalid Names* 8. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 1, 6—11, & 102. 1942; Moldenke, *Alph. List Invalid Names* 45, 47, & 49—51. 1942; G. N. Jones, *Fl. Ill.* [Am. Midl. Nat. Monog. 2:] 216. 1945; Moldenke, *Castanea* 10: 37. 1945; Moldenke, *Am. Journ. Bot.* 32: 610. 1945; Deam, Kriebel, Yuncker, & Friesner, *Proc. Ind. Acad. Sci.* 55: 56. 1946; Moldenke, *Alph. List Cit.* 1: 9, 31, 94, 110, 113, 149—151, 163, 181, 193, & 234. 1946; Hill & Salisb., *Ind. Kew. Suppl.* 10: 242. 1947; Moldenke, *Alph. List Invalid Names Suppl.* 1: 22 & 27. 1947; Moldenke, *Phytologia* 2: 327 (1947) and 2: 478. 1948; H. N. & A. L. Moldenke, *Pl. Life* 2: 75. 1948; Moldenke, *Alph. List Cit.* 2: 390—392, 394, 396—400, 451, 472, 544, 549, & 596 (1948), 3: 653, 699, 706, 723, 788, 790, 793, 800, 822, 852, 887, 904, 926, 927, 932, &

970 (1949), and 4: 981, 1138, 1139, 1199, 1208, 1221, 1226, 1227, 1255, 1261, & 1298. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 2, 12--15, 17, 18, 20, 21, 26, & 199. 1949; E. D. Merr., Ind. Raf. 205 & 295. 1949; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 127, 131, & 134. 1952; Moldenke, Phytologia 4: 185. 1953; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 2, 3: 127, 131, & 134. 1958; Moldenke, Am. Midl. Nat. 59: 345 & 357--359. 1958; Moldenke, Résumé 5, 16--19, 21, 22, 25, 26, 32, 359, 360, 365, 371, 375, 377, 378, & 473. 1959; Moldenke, Résumé Suppl. 2: 2. 1960; Moldenke, Phytologia 8: 121 (1961) and 8: 268, 272, 279, 280, & 435. 1962; Moldenke, Résumé Suppl. 3: 6 (1962), 4: 3 (1962), 5: 7 (1962), 6: 1, 2, & 10 (1963), and 7: 9. 1963; Steyerl., Fl. Mo. 1260 & 1261, map 1844. 1963; G. N. Jones, Fl. Ill., ed. 3 [Am. Midl. Nat. Monog. 7:] 213. 1963; Gleason & Cronquist, Man. Vasc. Pl. 581. 1963; Moldenke, Phytologia 8: 464 (1963), 9: 53, 54, 215, & 220 (1963), and 9: 356 & 359. 1963; Moldenke, Résumé Suppl. 10: 1. 1964.

Illustrations: Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 134 (1952) and pr. 2, 3: 134. 1958.

This is the natural hybrid between V. bracteata Lag. & Rodr. and V. urticifolia L. with more or less intermediate characters. It resembles V. bracteata in habit, being a large diffuse plant, stouter and more erect when young, but sprawling, procumbent, or half-prostrate when mature, the stems assurgent or ascending, the branches many, large, and diffuse, the leaves broad and lacinate, rather than dissected, the spikes long and slender, and the bractlets smaller, usually only slightly surpassing the calyx, usually not conspicuous nor foliaceous, and mostly only 3--4 (rarely 7) mm. long. The flowers are blue, pinkish-blue, or white with a lavender tint. It is found rather commonly where the ranges of the two parental species overlap in central North America. It is based on the Verbena urticaefolio-bracteosa of Engelmann, of which cotypes were collected by Carl Andreas Geyer at Beardtown, Cass County, Illinois, in July and August, 1842, and by George Engelmann — in whose honor it is named — in Saint Louis, Missouri, in July (and perhaps at other times), 1842, the originals being deposited in the Torrey Herbarium at the New York Botanical Garden.

Synonymous designations are typified as follows: V. brachiata Nieuwl. is based on Nieuwland s.n., collected at Saint Mary's, Saint Joseph County, Indiana, in October 1926, and deposited in the United States National Herbarium at Washington; V. bracteata x stricta Schneck is based on J. Schneck s.n., collected in dry clayey soil along streets of Mount Carmel, Wabash County, Illinois, on June 25, 1879, deposited in the herbarium of the University of Illinois; V. bracteata x urticifolia Gates is based on J. L. Sheldon s.n., collected at Lincoln, Lancaster County, Nebraska, on July 16, 1898, deposited in the herbarium of West Virginia University; V. bracteosa x hastata Mackenzie is based on K. K. Mackenzie s.n., collected in a barnyard at Little Blue Tank, Jackson County,

Missouri, on August 2, 1896, deposited in the herbarium of the University of Illinois; V. bracteosa x stricta Clothier is based on G. L. Clothier s.n., collected at Saint George, Pottawatomie County, Kansas, on July 4, 1896, and deposited in the herbarium of Kansas State College; V. bracteosa x stricta Palmer is based on E. J. Palmer 4025, collected in waste places at Webb City, Jasper County, Missouri, on August 7, 1913, and deposited in the herbarium of the University of Illinois; V. bracteosa x stricta Schneck is based on J. Schneck s.n., collected on G. M. Kneippe's place, Mount Carmel, Wabash County, Illinois, on July 8, 1880, and deposited in the herbarium of the University of Illinois; V. bracteosa x urticaefolia Deam is based on C. C. Deam 39228, collected in Fulton County, Indiana, and deposited in the Deam Herbarium; V. bracteosa x urticifolia Eggert is based on H. K. D. Eggert s.n., collected at Glencoe on the Meramer River, Saint Louis County, Missouri, on July 28, 1879, and deposited in the herbarium of the Carnegie Museum; Verbena bracteoso-stricta Engelm. is based on C. A. Geyer s.n., collected at Beardstown, Cass County, Illinois, in August, 1842, and deposited in the herbarium of Dartmouth College; V. hastata x bracteosa Schneck is based on J. Schneck s.n., collected at Mount Carmel, Wabash County, Illinois, on June 15, 1888, and deposited in the herbarium of the University of Illinois; V. stricta x bracteosa Hitchc. is based on A. S. Hitchcock 972, collected in Pottawatomie County, Kansas, and deposited in the herbarium of Kansas State College; V. stricta x urticifolia Stevens is based on G. W. Stevens 1703, collected in woods near Alva, Woods County, Oklahoma, on July 14, 1913, and deposited in the herbarium of the University of Illinois; V. stricto-bracteosa Engelm. is based on G. Englemann s.n., collected at Saint Louis, Missouri, in August, 1845, and deposited in the herbarium of Dartmouth College; V. urticifolia x bracteata Gates is based on G. L. Clothier s.n., collected at Saint George, Pottawatomie County, Kansas, on July 4, 1896, and deposited in the herbarium of Kansas State College; V. urticifolia x bracteosa Eggert is based on H. K. D. Eggert s.n., collected at Glencoe, Saint Louis County, Missouri, on July 28, 1879, and deposited in the herbarium of the New York State Museum; and V. urticifolia x bracteosa Patterson is based on H. N. Patterson s.n., collected in Henderson County, Illinois, in July, and deposited in the herbarium of the New York State Museum. It should be noted here that the designation, V. stricta x urticifolia Stevens applies also, in part, to xV. illicita Moldenke.

The name, Verbena laciniata Raf., is placed here provisionally. Merrill (1949) states that it was published by Rafinesque without description, with the type from "Kentucky or Illinois". Whether or not this disposition of the name is correct depends on an ultimate examination of the type, not available as yet to me. The V.



laciniata of Briquet ["(L.) Briq." and "(Lam.) Briq."] is a valid species from South America, that of Kuntze is V. dissecta Willd., while that of Sessé & Mocino is Bouchea prismatica var. laciniata Grenz.

Collectors have found xV. perriana in very sandy soil, clayey or dry clayey soil, dry or open ground, sandy open ground, waste places, and barnyards, along sandy roadsides, roadsides, and streets, near houses, in woods and grassy woods, in bottomlands, and on or near riverbanks, to 1200 feet altitude, flowering and fruiting from June to September. Schneck reports that it blooms when V. hastata is not yet in flower and that "the flowers when fresh are very much like [those of V.] hastata in shape and color, [but the] whole plant [is] procumbent." A specimen in the Columbia University herbarium, with no collector designated, bears the note "Erect or half prostrate.....I find it assuming the erect position while young only. My best specimens are from those which are half prostrate. This species is plentiful here. Brendel thinks it is only one of the many hybrids." Dodge reports it as "plentiful" at Point Edwards, Ontario. Patterson says that it is "the most common hybrid Verbena here". Shacklette calls it "a weed of meadows and pastures" in Kentucky. Deam describes it as a large diffuse plant or sprawling, with assurgent stems and many diffuse branches. Hitchcock, on the label of his Iowa City collection, says "grassy woods near river bank; same as found at Hamburg which Watson calls a hybrid." The W. H. Rhoades s.n. from Edinberg, Johnson County, Indiana, is the finest specimen I have as yet seen. Nieuwland describes it as a "plant perfectly prostrate in mats a yard wide". Popenoe says "flowers larger than in V. bracteosa and white with a lavender tint."

Gates (1940) reports the hybrid from McPherson County, Kansas. Herbarium material has been misidentified and distributed in herbaria under the names V. bracteata Lag. & Rodr., V. bracteosa Michx., V. bracteosa brevibracteata Gray, V. bracteosa var. brevibracteata Gray, V. canadensis (L.) Britton, V. hastata L., V. hybrida Bicknell, V. officinalis L., xV. deamii Moldenke, V. spuria L., V. hastata x urticaefolia Pammel, and "Verbena hybrid". Rhoades records the common names "pidgeon grass", "holy-herb", "enchanter's plant", "European vervain", and "Juno's-tears" for this plant, but these are all names applied to the European V. officinalis with which he misidentified his collection. Palmer (1916) cites his no. 601. The E. Hall s.n. [1861], distributed as "V. bracteosa x urticifolia" in the United States National Herbarium, is actually V. canadensis (L.) Britton.

In all, 112 herbarium specimens, including the types of most of the names involved, and 4 mounted photographs have been examined by me.

Citations: ONTARIO: Lambton Co.: C. K. Dodge s.n. [Point Edward, July 27, 1902] (Mi, Mi, Mi). GEORGIA: County undetermined:

A. W. Chapman 69 [Mts. of Georgia] (W--1323060), s.n. [Northern Georgia] (W--1323061). ILLINOIS: Adams Co.: Seymour s.n. [Fall Creek, July 29, 1879] (Ur). Cass Co.: Geyer s.n. [Beardstown, July 1842] (Pr--cotype, T--cotype, T--cotype), s.n. [Beardstown, Aug. 1842] (Dt--cotype). Coles Co.: Ahles & Gilpin 7455 (Ur). Fulton Co.: J. Wolf s.n. [Canton, 1881] (W--56221); L. Wolf s.n. [Canton, 1874] (Al). Hancock Co.: S. B. Mead s.n. [Augusta, 1842] (Pr), s.n. [Augusta, June 1844] (C). Henderson Co.: H. N. Patterson s.n. [vicinity of Oquawka] (W--1323064, W--1323094, W--1323-137), s.n. [July] (Al). Menard Co.: E. Hall s.n. [Athens, Aug. 1866] (Ms). Monroe Co.: Winterringer 3814 (Il--29272). Wabash Co.: Schneck s.n. [June 25, 1879] (Ur), s.n. [July 8, 1880] (Ur), s.n. [Mt. Carmel, June 15/88] (Ur). Woodford Co.: V. H. Chase 11473 (Ur). County undetermined: F. Brendel s.n. [Illinois, 1873] (W--719681). INDIANA: Fulton Co.: C. C. Deam 39228 (Al, Dm). Jennings Co.: C. R. Barnes 28 (N). Johnson Co.: W. H. Rhoades s.n. [Edinberg] (Hs). Kosciusko Co.: C. C. Deam 55323 (Dm). Lagrange Co.: C. C. Deam 36661 (Dm). Lawrence Co.: C. C. Deam 17287 (Dm). Saint Joseph Co.: Nieuwland s.n. [St. Mary's, Oct. 1924] (W--1244514). IOWA: Black Hawk Co.: Carver s.n. [Cedar Falls, July 5, 1895] (Io--22919). Clarke Co.: Pammel & Pammel s.n. [Osceola, Sept. 27, 1924] (Io--114682). Decatur Co.: J. P. Anderson s.n. [July 23, 1903] (Io--52109). Emmet Co.: Wol- den s.n. [Estherville, Aug. 5, 1922] (Io--105155), s.n. [Esther- ville, Jul. 12, 1927] (Io--130461). Fremont Co.: A. S. Hitchcock s.n. [Hamburg] (Io--15300, Ka). Hardin Co.: M. E. Jones s.n. [Iowa Falls, Aug. 1876] (Po--71002). Johnson Co.: A. S. Hitch- cock s.n. [Iowa City] (Io--15301). Story Co.: Carver s.n. [Ames, July 14, 1896] (Io--15326); L. Leonard s.n. [Collins, Aug. 8, 1929] (Io--134217). KENTUCKY: Union Co.: Shacklette 499 (Ky). County undetermined: Short s.n. [Barrens of Ky., 1840] (Pr). WIS- CONSIN: Dane Co.: T. J. Hale s.n. [Madison] (Ws); Lapham s.n. [M. Spear, 1858] (Ws). LaCrosse Co.: L. H. Pammel s.n. [LaCrosse, 7- 20-1887] (Io--95114). Lafayette Co.: Manning s.n. [Shulesburg, July 19, 1883] (N). Milwaukee Co.: J. S. Douglas s.n. [Wis.] (Je). Sauk Co.: T. J. Hale s.n. [Baraboo, 1861] (Ws, Ws). KANSAS: Doniphan Co.: Agrelius, Hall, Lovejoy, & Maroney s.n. [8-18-18] (Lw). Pottawatomie Co.: Clothier s.n. [St. George, 7-4-96] (Ka); A. S. Hitchcock 972 (Ka, N, W--353769). Sedgewick Co.: M. A. Carlton 276 (Du--90890, W--71932). Shawnee Co.: E. A. Popenoe 23 (W--56202), s.n. [Topeka, July 17, '79] (W--1119629). MISSOURI: Jackson Co.: K. K. Mackenzie s.n. [July 19, 1896] (Dt, N), s.n. [Little Blue Tank, Aug. 2, 1896] (Dt, N, Ur). Jasper Co.: E. J. Palmer 4025 (Ur). Saint Louis Co.: Eggert s.n. [4 Aug. 1875] (Cm),

s.n. [Eureka, July 28, 1879] (Vt), s.n. [Glencoe, 28 July 1879] (Al, Cm, Cm, N). Saint Louis: Eggert 5318 (N); Engelmann s.n. [St. Louis, Sept. 1841] (W—71928), s.n. [St. Louis, July 1842] (Au—122814—cotype, Dt—cotype, T—cotype), s.n. [St. Louis, 1842] (Br—cotype), s.n. [St. Louis, Aug. 1843] (T), s.n. [St. Louis, Aug. 1845] (Dt), s.n. [St. Louis, Aug. 1859] (Br, T), s.n. [St. Louis] (F—photo of cotype, N—photo of cotype, S—cotype, S—cotype, Si—photo of cotype, Z—photo of cotype); Geyer s.n. [St. Louis, Sept. 1841] (Dt). ARKANSAS: Benton Co.: Plank s.n. (N). NEBRASKA: Cass Co.: J. L. Sheldon s.n. [Weeping Water, Aug. 17, 1898] (We); T. A. Williams 119 (W—71931). Lancaster Co.: J. L. Sheldon s.n. [Lincoln, July 16, 1898] (We). Otoe Co.: Thornber s.n. [Nebr. City, Aug. 1900] (Tu—98878). Saunders Co.: Rydborg 153 (N), s.n. [Mead, June 1890] (C, W—518124). OKLAHOMA: Lincoln Co.: J. W. Blankinship s.n. [Baker, 25 Aug. 1895] (W—313602). Woods Co.: G. W. Stevens 1703 (Du—65779, N, Ok, Ok, St—9270, St—9279, Ur, W—589635). WASHINGTON: Klickitat Co.: Suksdorf s.n. [July 9, 1898] (N). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 27 (C), 103 (Q); Engelmann s.n. [Amer. bor.] (Br, S, Sg—16096).

xVERBENA PERTURBATA Moldenke, Résumé Suppl. 5: 6—8, hyponym (1962), nom. nov.

Synonymy: Glandularia parodii x mendocina Covas & Schnack, Revist. Argent. Agron. 11: 96. 1944.

Bibliography: Covas & Schnack, Revist. Argent. Agron. 11: 96. 1944; Moldenke, Résumé Suppl. 5: 6—8. 1962; Moldenke, Phytologia 8: 396 (1962) and 10: 137. 1964.

This is the natural hybrid between Verbena parodii (Covas & Schnack) Moldenke and V. mendocina R. A. Phil., with more or less intermediate characters. It is known only from the area in Mendoza where the ranges of the two parental species overlap. It is described by Covas & Schnack (1944) as follows: "Hemos hallado en la localidad del tipo [i.e., the type locality of V. parodii] una población formada, muy probablemente, por híbridos (y formas derivadas de éstos) entre esta especie y Glandularia mendocina....La población híbrida presenta una amplia gama de variación que comprende formas intermedias y formas vecinas a ambos padres; en algunas de estas formas hemos podido observar flores con pequeños lóbulos petaloideos en la base del limbo de la corola, carácter que nunca hemos observado anteriormente en el género Glandularia."

Planta hybrida aspectu Verbena parodii et V. mendocina intermedia; limbo corollae interdum lobulis parvis petaloideis ad basin ornato.

VERBENA PERUVIANA (L.) Britton in Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1892.

Synonymy: Lychnidaea, veronicae folio, flore coccineo Feuille.,

Journ. Obs. Phys. C tes Orient. [3]: 36--37. 1725. Lychnidaea, veronicae folio, flor  coccineo Feuill., Journ. Obs. Phys. C tes Orient. [3]: pl. 25, [fig. 3]. 1725. Erimus peruvianus L., Sp. Pl., ed. 1, 1: 630. 1753. Lychnidea veronicae folio, flore coccineo Feuill. apud L., Sp. Pl., ed. 1, 1: 630, in syn. 1753. Verbena chamaedryfolia A. L. Juss., Ann. Mus. Nat. Hist. Paris 7: 73. 1806. Verbena veronicifolia J. Sm. in Rees, Cycl. 36: no. 28. 1817. Verbena chamaedrifolia A. L. Juss. ex Steud., Nom. Bot., ed. 1, 873. 1821 [not V. chamaedrifolia Briq., 1904]. Verbena melindres Gill. ex Lindl. in Edwards, Bot. Reg. 14: pl. 1184. 1828. Lychnidaea veronicae folio flore coccineo Feuill. apud Sweet, Brit. Fl. Gard., ser. 2, 1: pl. 9, in syn. 1829. Verbena coccinea Hort. ex Reider, Ann. Blumisterei 7: 288--289 & 298, pl. [24]. 1831. Verbena melindroides Cham., Linnaea 7: 270--271. 1832. Verbena melissoides Sweet ex Cham., Linnaea 7: 270, in syn. 1832. Verbena chamaedrifolia var. elfordiana Benth. in Maund & Henslow, Botanist 3: pl. 129, in part. 1839. Verbena picta Marnock, Floricult. Mag. 5: 87. 1840. Verbena veronicaefolia J. Sm. apud Steud., Nom. Bot., ed. 2, 2: 750, in syn. 1841 [not V. veronicaefolia Humb., 1825, nor Humb. & Bonpl., 1841, nor Humb. & Kunth, 1846, nor H.B.K., 1818, nor Kunth, 1847]. Verbena chamaedryoides Hoffmgg., Preis. Verz. Orchid. 28. 1842; Linnaea 16: Litt. 282. 1842. Verbena chamaedryfolia var. latifolia Aut. ex Hoffmgg., Preis. Verz. Orchid. 28, in syn. 1842; Linnaea 16: Litt. 282, in syn. 1842. Verbena chamaedrifolia  $\alpha$  melindres (Gill.) Schau. in A. DC., Prodr. 11: 537. 1847. Verbena chamaedrifolia  $\beta$  melindroides (Cham.) Schau. in A. DC., Prodr. 11: 537. 1847. Verbena chamaedryfolia  $\alpha$  melindres (Gill.) Schau. in Mart., Fl. Bras. 9: 182. 1851. Verbena chamaedryfolia  $\beta$  melindroides (Cham.) Schau. in Mart., Fl. Bras. 9: 182. 1851. Verbena chamaedrifolia L. ex Lorentz, Veg. Nordeste Proc. Entre R os, ed. 1, 150. 1878. Verbena peruviana Kuntze ex Briq., Ann. Conserv. & Jard. Bot. Gen v. 7-8: 290, in syn. 1904. Verbena peruviana Druce ex Lindman, Vi och Vara Blomm. pl. 42. 1911--1913. Verbena peruviana (L.) Druce, Rep. Bot. Exch. Club Brit. Isles 1913 (3): 425. 1914. Verbena sanguinea Larraff., Escritos D. A. Larraffaga 2: 9. 1923. Verbena chamaedryfolia elfordiana Maund ex Stapf, Ind. Lond. 6: 429. 1931. Glandularia peruviana (L.) Small, Man. South-east. Fl. 1139 & 1508. 1933. Verbena peruviana Juss. ex Gallinal, Bergalli, Campal, Aragone, & Rosengurtt, Stud. Nat. Mead. Urug. 81. 1938. Verbena chamaedrifolia var. melindres (Gill.) Schau. ex Moldenke, Prelim. Alph. List Invalid Names 56, in syn. 1940. Verbena chamaedrifolia var. melindroides (Cham.) Schau. ex Moldenke, Prelim. Alph. List Invalid Names 56, in syn. 1940. Verbena



peruviana R. & P. ex Moldenke, Lilloa 10: 385, in syn. 1944. Verbena chamaedrifolia var. melindres Schau. ex Augusto, Fl. Rio Grande do Sul 232, in syn. 1946. Verbena chamaedrifolia var. melindres Juss. ex Daniel, Verb. Cent. Antioq. 2. 1947. Verbena chamaedrifolia var. melindroides Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena chamaedryfolia var. melindres (Gill.) Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena coccinea Waterer ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena peruviana (L.) Briq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Grandularia peruviana (L.) Small apud Martínez Crovetto & Piccinini, Revist. Invest. Agric. 4: 77 & 225. 1951. Lychnidea veronicae folio Feuille. ex Moldenke, Résumé 318, in syn. 1959. Verbena chamaedrifolia var. melindre Schau. ex Reitz, Sellowia 11: 134, sphalm. 1959. Verbena chamaedryfolia var. elfordiana Maund ex Moldenke, Résumé 362, in syn. 1959. Verbena melinderi Prager ex Moldenke, Résumé 369, in syn. 1959. Verbena melindri Prager ex Moldenke, Résumé 369, in syn. 1959. Verbena chamaedryfolia L. ex Moldenke, Résumé Suppl. 5: 7, in syn. 1962. Verbena melindres var. major Martens ex Moldenke, Résumé Suppl. 5: 7, in syn. 1962. Verbena melindris Gill. ex Moldenke, Résumé Suppl. 5: 7, in syn. 1962. Verbena chamaedrifolia Grill. ex Maria, Pl. Vall. Cochab. 38. 1962. Verbena chamaedryfolia f. camporum Osten ex Moldenke, Résumé Suppl. 5: 7, in syn. 1962. Verbena peruviana L. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. Verbena peruviana Michx. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963.

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Low procumbent half-hardy perennial herb, with loose spreading habit; stems prostrate or creeping, rooting at the nodes, very slender or filiform, forked, to 45 cm. long, hirtous, the tips and branches ascending; leaves small, decussate-opposite, gray or slightly grayish, oblong or oblong-lanceolate to ovate, broadly cuneate at the base and narrowed into the extremely short petiole, crenate or doubly crenate-serrate to unequally incised-serrate or almost incised-dentate, strigose above, more or less short-hirtous especially on the venation beneath; inflorescence spicate; spikes solitary, long-pedunculate, ascending, densely corymbose-flowered, flattened-capitate when young, to 6.5 cm. wide during anthesis; bractlets less than half the length of the calyx, ciliate-margined; flowers odorless, very showy; calyx canescent-hirtellous; corolla hypocrateriform, very showy, varying from red, brilliant-red, cinnabar-red, fire-red, spectrum-red, or dark-red to scarlet, vivid-scarlet, brilliant-scarlet, red-scarlet, or purple-cinnabar, its tube somewhat surpassing the calyx, the limb to 1 cm. wide; chromosome number:  $2n = 10$ .

Linnaeus (1753) based his Erinus peruvianus on Feuillée's Lychnidaea, veronicae folio, flore coccineo, of which the type was collected by Louis Feuillée in Paraguay (not in Peru as implied by Linnaeus and as stated by Schauer in 1851), who says of it "Je trouvai cette plante dans les campagnes qui sont sur le bord septentrional de la rivière de la Plata, dans le Paraguay." There seems to be no actual specimen in the Linnean Herbarium, and Linnaeus seems simply to have supplied the brief descriptive sentence "ERINUS foliis lanceolato-ovatis". I therefore regard Feuillée's collection as the type of the species.

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#### BOOK REVIEW

Alma L. Moldenke

"Flora of Missouri", by Julian A. Steyermark, 1808 pp., 2300 illustr. Iowa State University Press, Ames, Iowa. 1963.  
\$18.50

This work is superb and monumental. Seldom can an active sci-